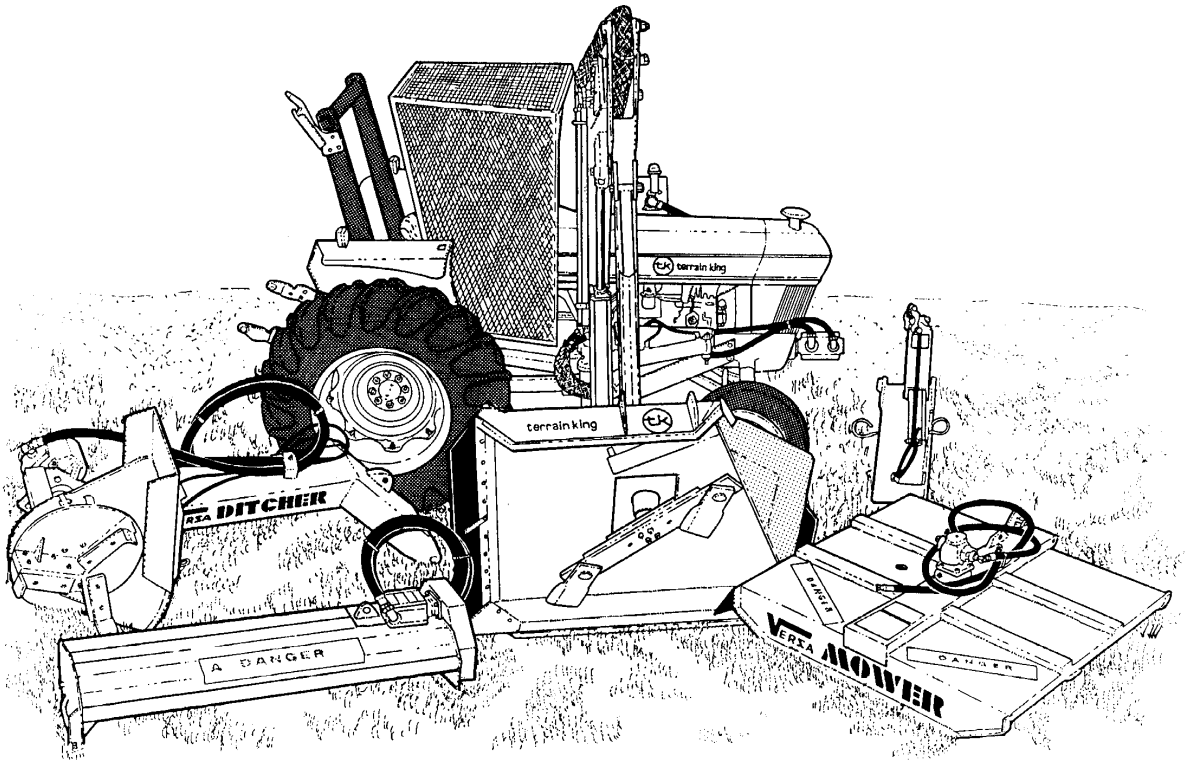
VERSA FLAIL

Assembly Instruction Manual

Case - IH MXU 100 / 110
(Cab / 4 Wheel Drive Tractor)



VERSA MOWER

Tractors equipped with additional options, special equipment, tractor manufacturer modifications, new tractor models, or Customer alterations may prevent this Mount Kit from being properly mounted to the tractor. Alamo Group is not responsible for modifications to the MountKit to accommodate these differences.

ALAMO INDUSTRIAL
1502 E. Walnut
Seguin, Texas 78155
210-379-1480

Manual Published 09-04
P/N 02981763

MEMBER OF THE ALAMO GROUP
ALWAYS ON THE CUTTING EDGE

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INTRODUCTION

ABOUT THIS MANUAL:

The intent of this publication to provide the competent technician with the information necessary to perform the CORRECT Assembly to the Alamo Industrial Product. This will, in turn provide for complete customer satisfaction

It is hoped that the information contained in this and other Manuals will provide enough detail to eliminate the need for contact of the Alamo Industrial Technical Service Dept. However, it should be understood that many instances may arrive where correspondence with the Manufacturer is necessary.

CONTACTING MANUFACTURER: (Please help us Help You! Before You Call!)

Alamo Industrial Service Staff Members are dedicated to helping you solve your problem, or your customer's service problem as quickly and efficiently as possible. Unfortunately, we receive entirely to many calls with only a minimum amount of information. In some cases, the correspondent has never gone out to look at the equipment and merely calls inquiring of the problems described to him by the operator or customer.

Most calls received by Alamo Industrial Service can be classified into approx. 6 general categories.

1. Hydraulic or Mechanical Trouble Shooting.
2. Request for Technical Information or Specifications.
3. Mounting or Fitting Problem.
4. Special Service Problem.
5. Equipment Application Problems.
6. Tractor Problem Inquiries.

HOW YOU CAN HELP:

Make sure the call is necessary! Most of the calls received may not be necessary if the Dealer Service Technician would do the following.

1. Check the Service Information at your Dealership provided by Alamo Industrial, This would include, Service Bulletins, Information Bulletins, Parts Manuals, Operators Manuals, Assembly Manual or Service Manual, many of these are available via the Alamo Industrial Internet site (www.Alamo-Industrial.Com). Attempt to diagnose or repair problem before calling.

2. If a call to Alamo Industrial is needed, Certain Information should be available and ready for the Alamo Industrial Service Staff. Such information as, Machine Model, Serial Number, Your Dealer Name, Your Account Number and Any other information that will be useful. This information is vital for the development of a prompt and correct solution to the problem. This will also help to develop a database of problems and related solutions, which will expedite a solution to future problems of a similar nature.

3. The technician may be asked to provide detailed information about the problem including the results of any required trouble shooting techniques. If the information is not available, The technician may be asked to get the information and call back. Most recommendations for repairs will be based on the procedures listed in the Service Manual / Trouble Shooting Guide and Information provided by customer.

CONTACT ALAMO INDUSTRIAL:

Alamo Industrial, 1502 E. Walnut St. Seguin TX. 78155, Technical Service Dept. PH: 830-379-1480

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Section 1

VERSA FLAIL

Pre-Delivery Check List

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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VERSA MOWER PRE-DELIVERY INSPECTION CHECKLIST

Pre-Operation Inspection: Check the following items before operating the unit to assure that they are properly assembled.

Saftey Equipment:

___ Operators Manual is with Unit.
___ The Safety Decals are installed as listed in the Assembly Manual.
___ Valve operation plate is installed.
___ Operators cage or Tractor Cab is in place
___ Deflectors are installed on the Mower Head
___ Tractor Rops or Cab with seatbels installed properly.
___ All Foot Guards and safety switch are installed and functional.

Frame:

___ Axle Plate Bolts are torqued.
___ Head Mounting Bolts tightened.
___ Frame attaching Bolts tightened.
___ Front Support Bolts are torqued.
___ Hydraulic Tank mounting Pins / Bolts in place correctly.
___ All Welds inspected toinsure proper welds and locations.

Hydraulic System:

___ Oil Level in Hydraulic Tank is within the sight gauge.
___ Hose connections are tight.
___ Hoses do not have any kinks or twist in them.
___ Front Pump Shaft adapter bolts are tight.
___ Front Pump Shaft Coupler / Drive Shaft is lubricated and has an anti-seize compound on the Splines of Pump and Shafts.
___ The Pump Drive Shaft has correct alignment.
___ Suction Hose has no leaks or kinks.

Flail Mower Head:

___ Skid Shoe Bolts are torqued
___ Motor Bolts are torqued
___ Belt Alignment& tension adjustment is correct.
___ Cutter shaft bearings are properly lubricated
___ Roller bearings are properly lubricated
___ Blades swing freely.
___ All Belt guards are installed correctly.

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VERSA MOWER PRE-DELIVERY INSPECTION CHECKLIST

Pre-Operation Inspection: Check the following items before operating the unit to assure that they are properly assembled.

Tractor Mower Operation Inspection:

Using all Safety precautions, operate the Tractor and Mower unit for 30 minutes and while the unit is running check the following items: **Note!** Only make adjustments after the mower has been turned off and all motion has stopped and all hydraulic pressure has been relieved.

___ Check for Hydraulic oil leaks at the hose connections
___ Operate the mower head throughout its full range of motion and check for hose's rubbing, pinching, or kinking.
___ Make sure the Return Filter Gauge is reading in the Green after Oil is warm.
___ Check the function of the Mower Head On-Off Valve and switch for proper function
___ Make sure that the tractor will not start with the mower on-off switch in the on position.
___ Check the Blade Rotation for the Rotary Mower Head to make sure it is turning Clockwise looking from the top of the mower deck.
___ Make sure the control valve movements agree with the valve operation decal.
___ Make Sure Boom Movement operates as expected and is smooth and under control (no air in the control system)
___ Look for any unusual or excessive noise or vibrations.
___ Make sure the left rear wheel of the tractor stays on the ground when the Head is fully extended horizontally with 200 lbs. placed on the outside of the mower head.

Post-Operation Inspection:

___ Check that the oil in the hydraulic tank has not turned milky in color or has foam on top.
___ Check that there are no loose fasteners or hardware.

Torques specifcations are based on the bolt torque chart.

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Section 2

VERSA MOWER

General Information

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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General Information

To help you assemble your new Versa and mount it to your tractor, we provide you with drawings, instructions and general information. When needed, you can get information or clarification from Alamo Group Customer Service or from engineering departments over the phone.

This publication provides general information not specifically for your case or tractor, but, in connection with the drawings, this publication offers you some valuable assistance - please read it thoroughly.

These mount kits are made for selected tractors with standard configurations. Only the noted options and tire sizes listed on the installation drawings will work with these mount kits. Other options, front axles, or different tire sizes may prevent the mount kit from fitting your non - standard tractor. Alamo Group cannot take responsibility for these problems or any modifications made to the unit.

These instructions have been prepared to assist you in the correct procedure for mounting an Alamo Group A-Boom on your tractor.

Throughout these instructions, references are made to right or left directions. Right and left are determined by sitting on the tractor seat and facing the direction of travel.

This is the Safety-Alert symbol. When you see this symbol on your machine or in these instructions, be alert to the potential for personal injury.

Follow recommended precautions for safe assembly and operating practices.

DANGER!	A signal word - DANGER, WARNING, or CAUTION - is used with the Safety Alert symbol identifies the most serious hazards.
WARNING!	Safety signs with signal word WARNING are typically used to point out more serious hazards.
CAUTION!	General precautions are listed on CAUTION safety sign. CAUTION also calls attention to safety messages in these instructions.

NOTE: Included in the packing box of this unit is a replacement filter element for filter assembly in the tank. This mower unit's hydraulic components have been carefully cleaned and packaged at the factory to prevent contamination from entering the system. However, dust and dirt particles may enter into the sealed components through transportation, handling, rain or just sitting in a dirty or harsh environment. Therefore to assure that the hydraulic system is properly clean please adhere to the following procedure.

1. Prepare the area where the unit is to be assembled. The area should be on a hard concrete floor that has been swept clean of all dust and contaminants. Un-package the mower unit carefully so that the seals on the hydraulic components are not broken or pulled off. Lay out parts to make location easy. Figure 1

2. Inspect and clean all hydraulic hoses and fittings prior to installing them onto the tractor or mower. If dirt or material is seen in any of the parts, they should be washed and cleaned thoroughly with an oil-compatible solution. Do not blow the material further into a hose since this sometimes does not remove the foreign material and can cause damage to hydraulic components down stream.

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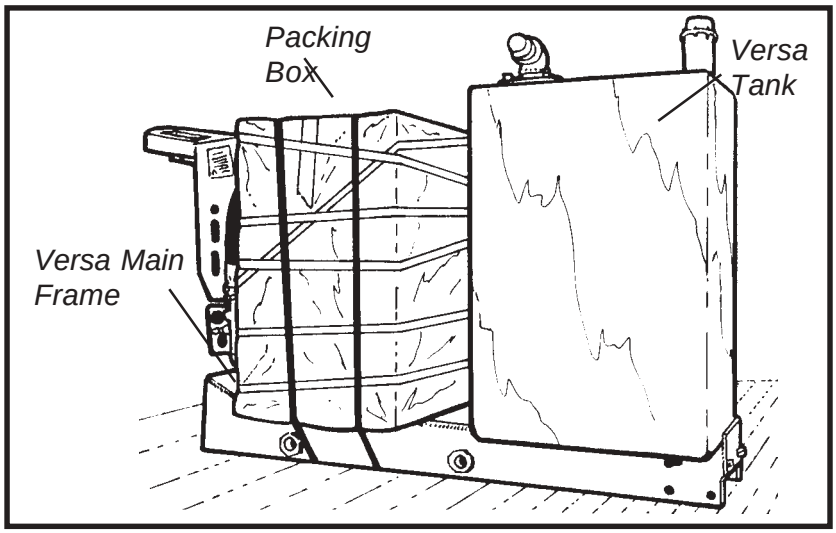
3. Be sure your Mount Kit shipment agrees with the Installation Make certain that you have been sent the correct Mount Kit for your tractor. Make sure that all hydraulic fittings are not damaged or open to the elements, if any of the hydraulic components are contaminated do not use them until they are cleaned or replace them.. During Assembly or operation a damaged fitting could cause a leak severe enough to drain the hydraulic fluid and cause the Versa to fail.



The tools you will need at the assembly site are as follows:

1. A welding setup, including correct head gear, eye shields, and protective clothing.
2. Impact wrench or socket and ratchet set.
3. Rubber mallet.
4. Box-end, allen, and crescent wrenches.
5. Drift pins.
6. Phillips and straight-blade screwdrivers.
7. Forklift or hydraulic floor jacks with rolling back boards.
8. Small crane hoist or block-and-tackle.
9. Multidirectional Levels.
10. Paint Scraper.
11. Safety shoes, safety glasses, and gloves. A hard hat should be worn by anyone working under the crane hoist or block-and-tackle.
12. Hydraulic Filter Pump Cart.
13. Torque Wrench, 3/4” and 1/2” drive type.

Remember to follow each step closely and cautiously. Be aware of all support personnel at all times. Keep the assembly area as clean as possible; clean up all spills when they occur. A safe assembly area and a crew that is sensitive to the dangers involved in putting this implement together will help protect lives. Keep all unauthorized personnel from the area. Do not assemble the Versa in an area where children play. Do not allow children near the assembly site nor allow them on or near the tractor after assembly. There is no safe place for anyone except the operator on the tractor and those helping with the assembly.

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RECOMMENDED TORQUE VALUES CHART:

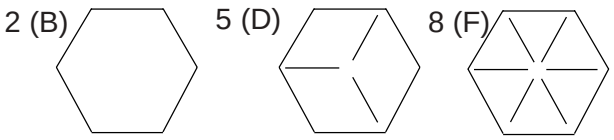
RECOMMENDED HOSE END TORQUE VALUES FOR 37 DEGREE ANGLE STEEL HOSE END FITTINGS

DASH SIZE	NOMINAL SIZE (IN.)	TORQUE VALUE* (IN.LBS.)	(FT.LBS.)
-4	1/4	140	12
-6	3/8	230	19
-8	1/2	450	38
-10	5/8	650	54
-12	3/4	900	75
-16	1	1200	100
-20	1-1/4	1600	133
-24	1-1/2	2000	167
-32	2	2800	233

* Straight threads do not always seal better when higher torques are used. Too much torque causes distortion and may lead to leakage.

RECOMMENDED TORQUE VALUES CHART:

RECOMMENDED TORQUE IN FT.-LBS. (Nm)
COARSE AND FINE THREADS



Bolt Dia.	Plain Head	Three Dashes	Six Dashes
1/4"	Not used	10 (14)	14 (19)
5/16"	Not used	20 (27)	30 (41)
3/8"	Not used	35 (47)	50 (68)
7/16"	35 (47)	55 (75)	80 (108)
1/2"	55 (75)	85 (115)	120 (163)
9/16"	75 (102)	130 (176)	175 (237)
5/8"	105 (142)	170 (230)	240 (325)
3/4"	185 (251)	300 (407)	425 (576)
7/8"	160 (217)	445 (603)	685 (929)
1"	250 (339)	670 (908)	1030 (1396)
1-1/8"	330 (447)	910 (1234)	1460 (1979)
1-1/4"	480 (651)	1250 (1695)	2060 (2793)

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General Information

IMPORTANT: Change the return filter in tank and suction filters after the first 200 hours of operation. Change the filters again at 700 hours; then, change the oil and filters at 1600 hours. After that, continue to change the filter every 800 hours and the oil every 1600 hours. Hydraulic oil to be used is Universal Tractor Hydraulic . Use the above procedures as part of a good filter maintenance program.

Between filter changes, monitor condition of filter by reading Pressure Gauge mounted on filter on top of the Tank. If pressure reads 15 psi or greater at 1800 RPM engine speed and normal operating temperature (140 deg. F. or greater), filter element should be changed. Pressure gauges are color-coded to help indicate when to change element.

WARNING!

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks. If **ANY** fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

CAUTION!

To prevent personal injury, always wear **SAFETY SHOES, SAFETY GLASSES**, and **GLOVES. A HARD HAT** should be worn by anyone working under a Crane Hoist or
Block-and Tackle.

WARNING!

When working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards. Watch out for others.

CAUTION!

ALWAYS USE GLOVES WHEN HANDLING THE BLADES! Before re moving or installing blades, make sure that the head is leaned back past the vertical position. If the head is not, the blades can come off suddenly when the bolts are removed.

WARNING!

Block up or securely support components before working under or around lifted components. Inadvertent falling can cause serious injury or death.

CAUTION!

The operator should not leave his seat with this valve engaged or with the tractor engine running. Allow approximately 60 seconds for the blades to come to rest after turning the switch off before dismounting.

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Section 3

VERSA FLAIL

Mainframe and Flail Head Installation

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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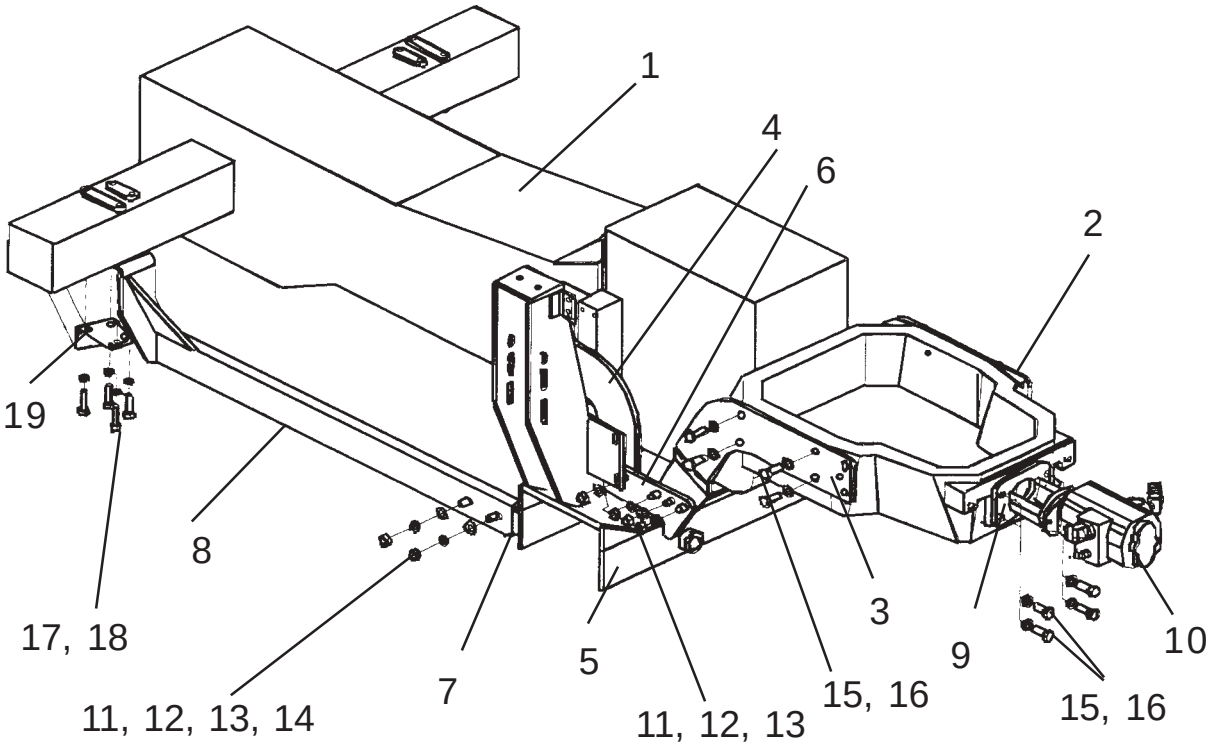
Versa Frame



Item	Part No.	Qty.	Description
1	----------	1	Case-IH MXU 100 / 110 Tractor Chassis
2	02981218	1	Front Mount Plate, LH Side
3	02981219	1	Front Mount Plate, RH Side
4	02981518	2	Rear Mount Plate, LH or RH Side
5	02887200	1	Versa Frame Weldment
6	02978816	2	Plate, Versa Weld On
7	02879100	1	Flat, Axle Mount Bracket
8	02981723	1	Stabilizer Weldment, Rear Axle Mount
9	02980719	1	Pump Mount Asy. w/ Cover
10	02961826	1	Pump Asy.
11	02959390	14	Bolt, 3/4” NC X 2-1/4 Gr. 8
12	00000200	14	Nut, 3/4” NC
13	00003901	14	Heavy Lockwasher, 3/4”
14	5312316	2	Hardened Flatwasher, 3/4”
15	02975692	20	Bolt, M20-P2.5 X 50 mm Gr. 10.9
16	02971158	20	Lockwasher, 20 mm
17	02970066	4	Lockwasher. 18 mm
18	02977576	4	Bolt, M18-1.5 X 60 mm Gr. 10.9
19	----------	1	3 Point Stabilizer Bracket (On Tractor)

Figure 1

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Versa Frame

1. Versa Frame Mounting Components. Shown in Figure 1 are the parts needed to mount the versa frame to the tractor. Follow instructions listed below and reference back to figure 1 as needed.

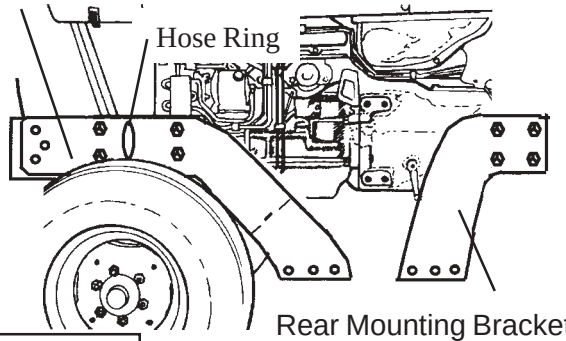
2. Remove The factory Brackets. There is a factory mounting bracket on each side of the tractor which if for mounting options on the tractor. The one on the RH side bolts behind the battery box and the LH side it bolts behind the fuel tank, the tank may have to be lossened and moved outward to get to the bracket bolts. These bracket will be removed and not used. (See Figure 2)

3. Install Versa Frame Mounting Brackets. The bolt holes in the tractor frame will be used to mount the front and the rear versa frame mounting brackets. The Rear Mounting Brackets P/N ---------- (LH or RH same bracket). The front mounting brackets has a RH (P/N 02981219) & LH (P/N 02981218), make certain that they are mounted correctly. The Front Mounting bracket will have a metal hose ring (P/N 02978281) that will need to be welded to them, one for each side If Mounted correctly the front and rear LH & RH brackets will be the same width apart at the bottom where each has the three holes. (See Figure 3).

4. Install Versa Mount Plate to Mounting Brackets. The mounting Plates (LH & RH side) will bolt to the mounting brackets using the six bolts on each side. Bolt these plates to the outside of the mounting brackets. Install all six bolts and snug them only as you will be removing them later to completely weld them to the versa frame (See Figure 4)

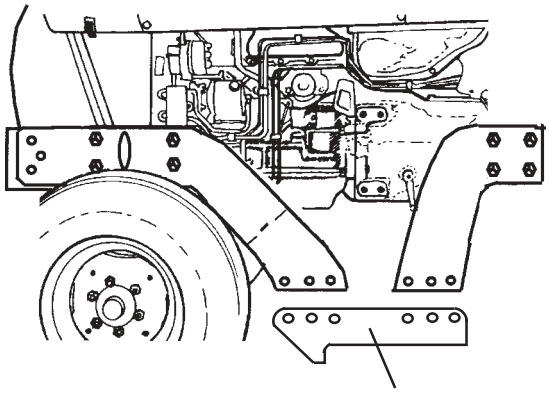
Figure 2

Front Mounting Bracket LH P/N 02980737 & RH P/N 02980738 w/ Hose Ring P/N 02978281 Welded on



Rear Mounting Bracket P/N 02980739 RH or LH

Figure 3



Versa Mount Plate P/N 02978816

Figure 4

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5. Fitting The Versa Frame. Using a floor jack insert the versa frame up under the tractor. The Versa Frame will fit up against the versa mount plate (See Figure 4). DO NOT do any welding of the versa frame until instructed to. The Versa Frame will have to be aligned for distance Left to Right.

6. Aligning Versa Frame with Mounting Brackets. The Versa Frame must be aligned with the mounting frame to where it will extend out past mounting plate 9-1/4" on the right hand side as shown in Figure 6. This measurement is important and must be correct in order for mower to operate correctly. The Versa Frame should be lower in the front by approximately 1/8" than in the back, this allows the mower to operate with the front of the mower a little lower than the rear. Once the measurements are correct check the versa frame for level. These level checks can be done on the LH side using a bubble level (See Figure 8) if leveled correctly then tack weld the versa frame to the mounting plate on both sides of the tractor, the tack welds need to be strong enough to hold the versa frame up. Recheck all measurements (See Figure 6). Make certain that the RH side (Shown) and the LH side mount plate is tack welded to the Versa Frame. The Tack weld must be sufficient enough to support the versa frame to the mounting plate when unbolted.

7. Install Frame Stabilizer to Axle and Versa Frame. There is a stabilizer weldment (P/N 02981723) that connect to Versa Frame and tractor rear axle. Front of the stabilizer will bolt to a flat bracket (P/N 02879100) that will be tack welded to the Versa Frame. Rear axle will keep the factory 3 point stabilizer bracket bolted back up below the stabilizer bracket. (See Figure 7). After bolting the flat stabilizer mounting bracket to the front of the stabilizer, tack weld it to the versa frame. (See Figure 7) DO NOT Remove Versa frame yet the Hydraulic Tank must be fitted to the Versa frame and the mounting tabs welded on to the versa frame (See Step 8 & Figure 8).

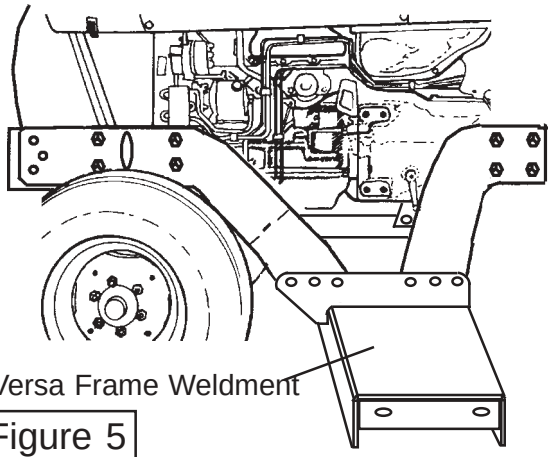


Figure 5

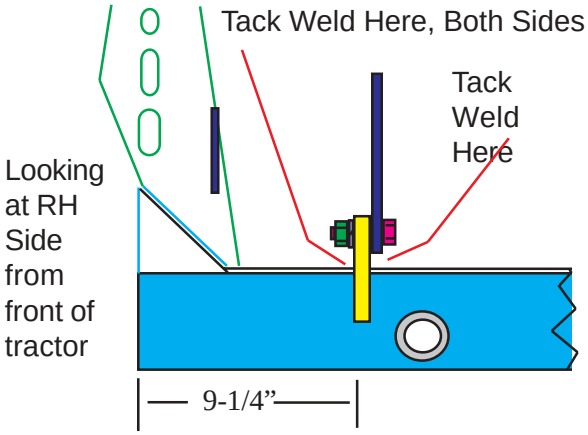
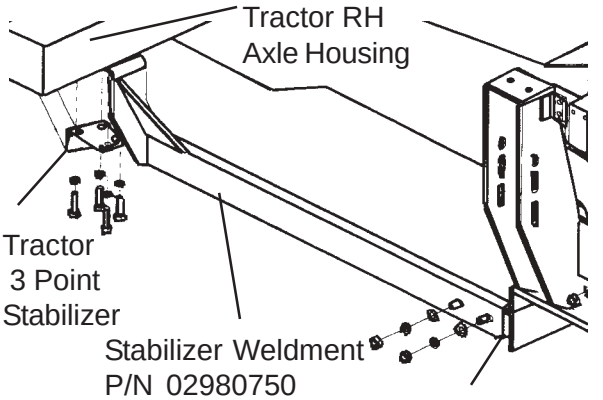


Figure 6


Tractor RH Axle Housing
Tractor 3 Point Stabilizer
Stabilizer Weldment P/N 02980750
Flat Axle Mount Bracket P/N 02879100
Figure 7

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8. Fit Hydraulic Tank. The Oil Tank (Asy P/N 02980869) is a manufactured tank designed to fit behind the LH rear wheel under the vender (See Figure 8, 9 & 10). It is easiest to mount the Tank with the Left rear wheel removed. The tank will mount with the suction tube connection under the fender pointing toward the front of the tractor. The Fill cap and return hose connection will be to the rear behind the tractor (See Figure 10).

9. Install the Versa Frame Step. The Versa Frame Step will NOT be welded to the side of the versa frame as on some other models because the LH Factory Tractor Step is retained to be used on this model Tractor (See Figure 11) The step is shown being reinstalled as it was removed to allow the fuel tank to be moved outward to allow the removal of the factory install accessory bracket , also it will be easier to tighten the rear frame mounting bracket to the tractor (See Figures 3. 4 & 5).

10. Install Stabilizer weldment to Rear axle. The stabilizer weldment bolts to the RH rear Tractor Axle up under the bottom side. The oter end will be bolted to the frame where the lug has been welded on. (See Figures 12 , 14 & 35) This is a two person job, one in front and one in rear under tactor (See Figure 35). The Flat Mounting lug (P/N 02879100) will need to be tack welded to the mainframe (See Figure 12 & 14) for welding later (See Figure 12)

Figure 8

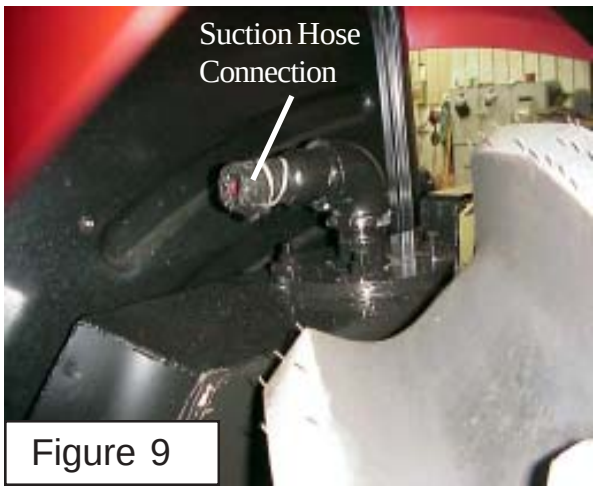

Figure 9

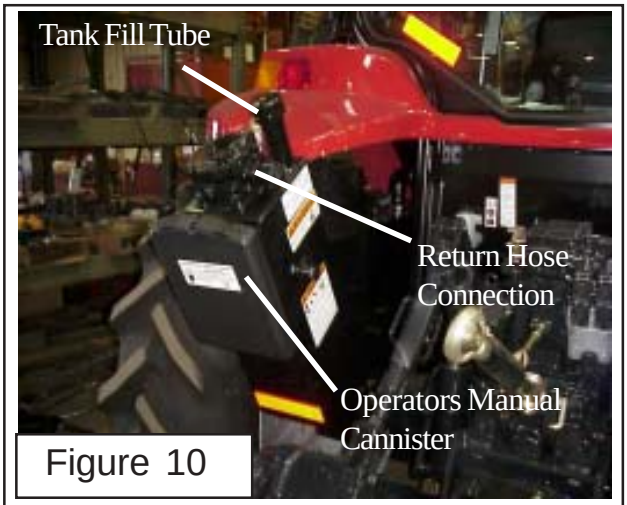

Figure 10

Figure 11

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Versa Frame

11. Remove and Weld Versa Frame. The Versa frame will need to be unbolted and removed. This will allow for welding the mounting plates, tank mount lugs, the step and the axle stabilizer mounting bracket to the versa frame. The welds need to welded securely to the frame, weld both sides of the mounting components (See Figure 12). Touch up the paint around the welded areas while the versa frame is off the tractor.

12. Reinstall Welded Versa Frame. With all the mounting components welded to the versa frame, bolt the versa frame back onto the tractor. Make certain that the bolts are installed on both sides. There are six bolts on each side that mount the mounting plates to the tractor front & rear mount plates. (See Figure 13). Bolt the axle stabilizer weldment to the mounting bracket that was welded to the versa frame. (See Figure 14 & 35). This can be a two person job to bolt to axle and fron at frame.

13. Torque the Mounting Bolts. The mounting bolts for the versa frame must be torqued to specifications, this will require a large torque wrench and two a person operation. See the Bolt Torque chart in the General information section of this manual or in the operators manual. It is recommended that the bolts be marked as they are torqued to show they have been done, this can be dome with a marker , paint or a method of your choice. (See Figure 15).

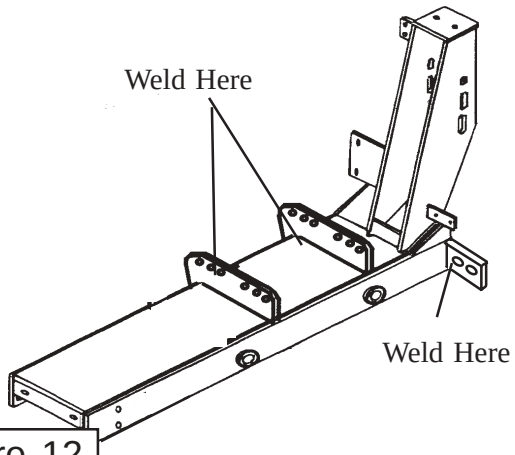

Figure 12

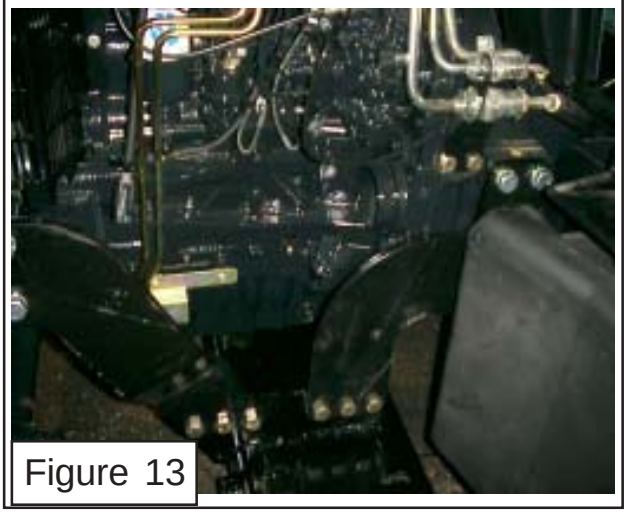
Figure 13

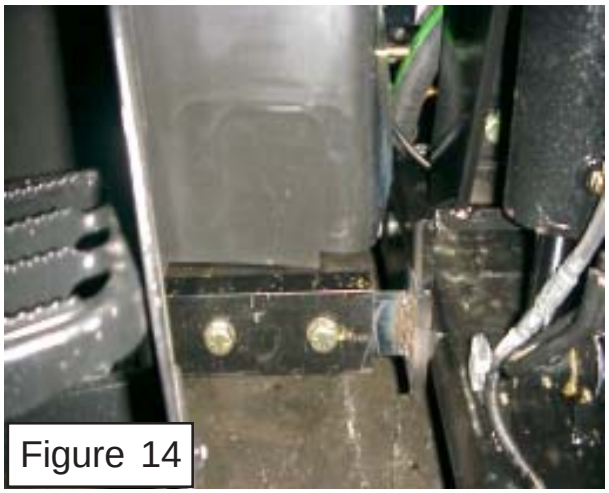
Figure 14

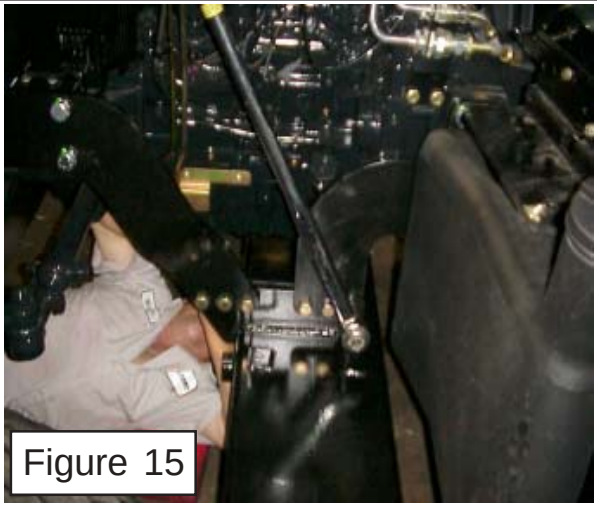
Figure 15

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14. Install Extension Arm Frame. The extension arm will be shipped with the hydraulic cylinders attached to it. The lift lug and cable will be attached. (See Figure 21). Move the Extension Arm into place on the right side of the tractor, this is easily done with a fork lift but can be done with a floor jack or over head hoist. Slide the Extension Arm under the base of the Versa Frame until the mounting pin holes align (See Figure 22). Coat the mounting pin with Anti-Seize compound before installing it into the versa frame. It should not require an excessive amount of force to install the pin. Moving the extension arm will help align it with the versa frame and make it easier to install the retaining pin. (See Figure 23). The retaining pin will have to be aligned when it is installed so the retaining bolt can be installed. The Pin retaining bolt will go through the frame and pin then be locked with a locknut. The pin can be rotated by inserting a drift pin or punch into the pin hole to align the holes. Install the retaining bolt into the hole of the versa frame and put tighten the locknut.

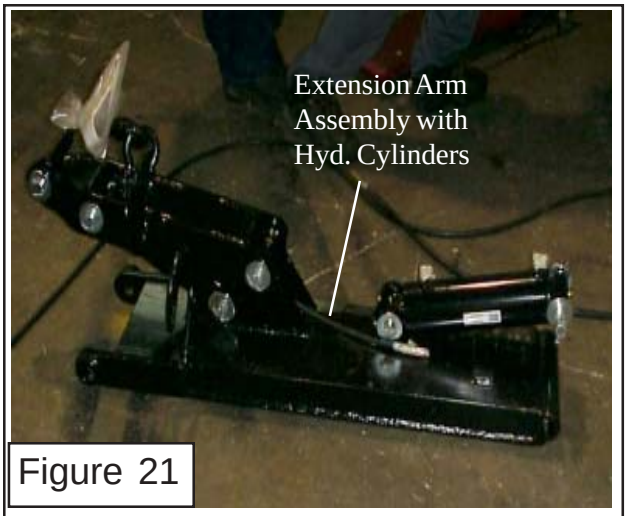

Figure 21

Figure 22

15. Connect the Extension Arm Lift Cylinder. The Lift cylinder connects to the versa frame. Install the cylinder pin in the center hole of versa frame. The lower hole would be used if the tractor was a tall tractor and the extension arm needed to be lower (See Figure 24 & 25).

Figure 23

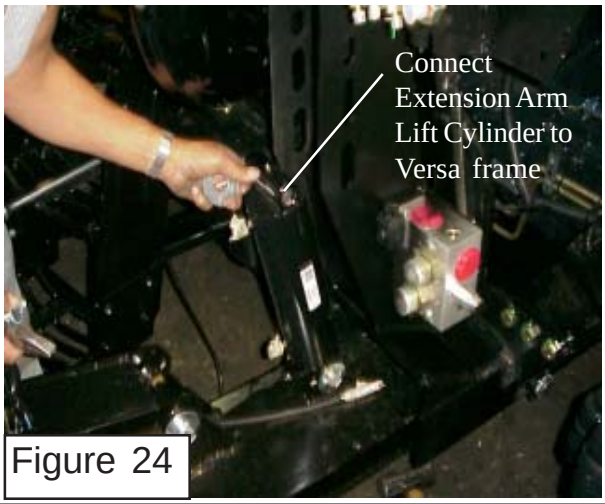

Figure 24

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16. Cutter Valve and Cylinder Control Valve. The cutter valve and the cylinder control valve are mounted on the versa frame and should be already bolted on to it when it is shipped to you. If they are not they will need to be bolted on. The mounting plates for the valves are attached to the versa frame, the valves will bolt on to them. (See Figure 24 & 25).

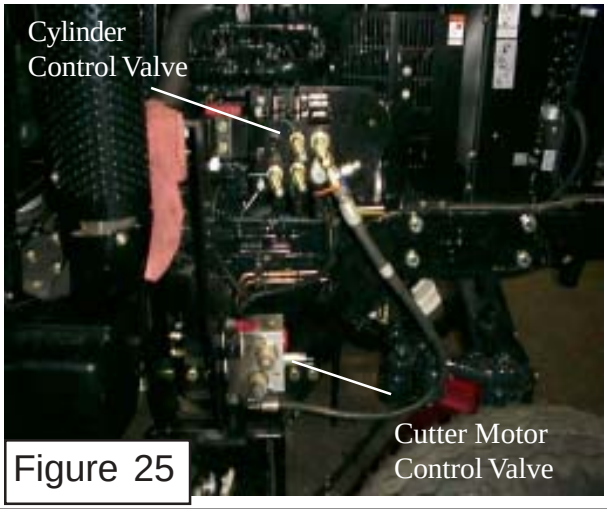

Figure 25

17. Connect Head to Extension Arm. The Head has an option, a rotary or a flail head, they will both connect to the extension arm. The head will be shipped assembled with the head attaching pin installed into the head. (See Figure 26). Remove the head attaching pin from the head (See Figure 26). The Motor Hoses are attached to the head, the motor hoses need to be put through the hose ring on the extension arm as head is moved toward the extension arm (See Figure 27). As the head is moved closer to the extension arm the hoses slide further through the hose ring (See Figure 27). Slide the head inward until the mounting lugs on the extension arm are aligned with the mounting tube on the head (See Figure 28). Coat the retaining pin with anti-seize and insert it into the extension arm lugs, make certain to keep the retaining bolt hole in pin aligned with hole in head mounting tube. When pin is in install the retaining bolt and locking nut (See Figure 28).

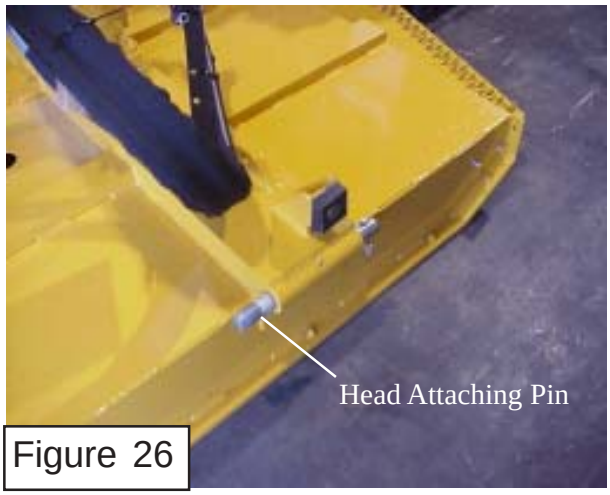

Figure 26

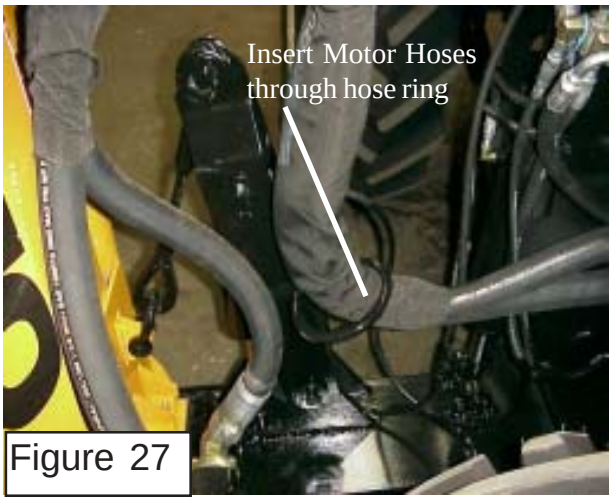

Figure 27

Figure 28

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18. Connect the Head Tilt Cable to Head. The Tilt cylinder lifts the frame weldment and the frame weldment is attached to the head with a cable and clevis assembly (See Figure 29). Unscrew the clevis and attach it to the deck lifting lug and tighten it.. (See Figure 29).

19. Connect the Motor Hoses to the Cutter Valve. The Motor has two hose connected to it and running through the hose ring on extension arm toward the cutter valve. It is important to ID which hose is which through the sleeving as these hose must correctly be attach to the cutter valve. The two hoses one is on the front side and one is on the back side of the mower deck, The one on the back side (toward the rear of the deck) is the pressure side (See Figure 30). Connect the Pressure hose to the upper fitting of cutter valve, these are the two large fittings pointing toward mower head (See Figure 31 & 32). Note: the Cylinder Control valve return hose is routed through the cutter valve, it is the smaller hose that connects into the bottom of the cutter valve. The return hose will need to be routed so that it clears the front tire of tractor as well as the frame components (See Figure 31).

Figure 29

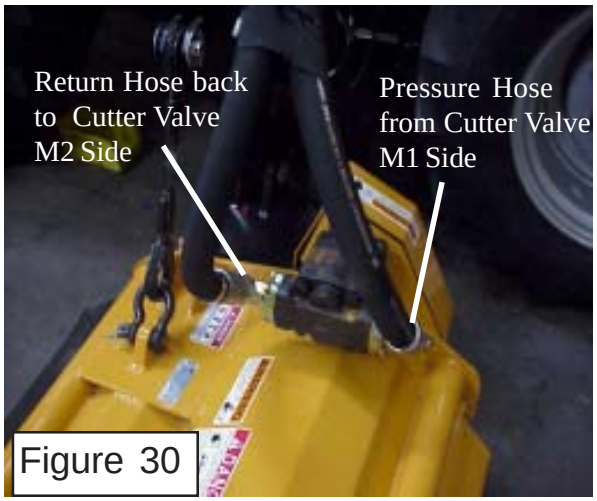

Figure 30

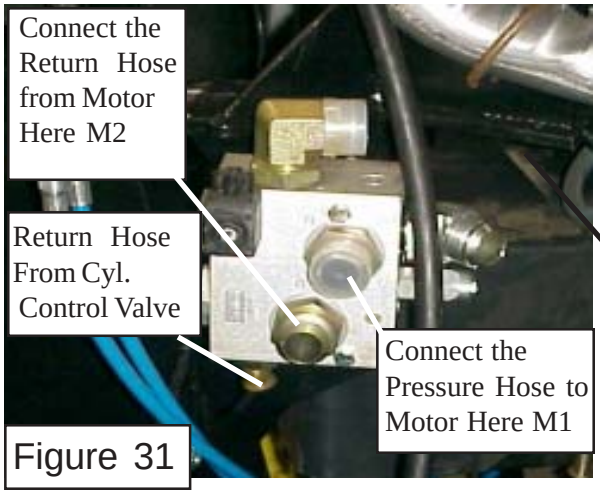

Figure 31

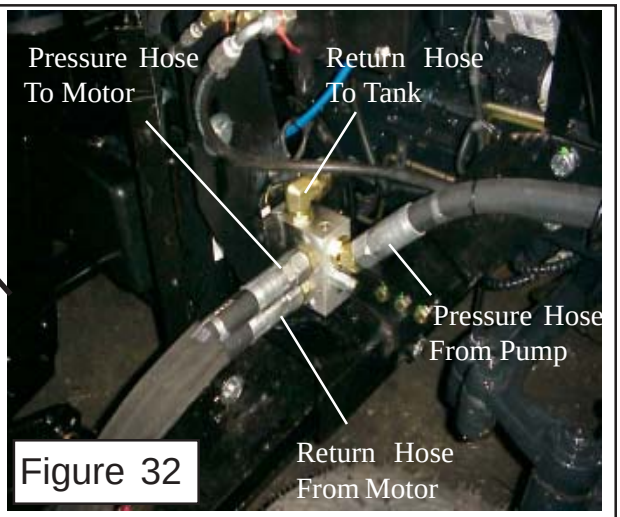

Figure 32

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20. Install Head Transport Strap. The head transport strap will be tied to the hose on the head when recieived (See Figure 33). The strap will bolt to the top of the frame as shown (See Figure 34). The transport strap drops over a hook that is welded to the head (See Figure 35). When the head is raised into the transport position (See Figure 37) and the pressure is relwased on the lift cylinder the transport strap will hold the head in position (See Figure 36 & 37).

Figure 33

Figure 34

Figure 35

Figure 36

Figure 37

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21. Install Hose Support Rings to LH Side for Suction Hose. The Rings will need to be welded to the LH side front and rear frame mounts to support the suction hose. Figure 38 shows thw Suction hose running through the hose rings where they have been welded to frame mounts. Figure 39 shows a hose support welded to the hydraulic tank behind LH rear tire . The suction hose runs behind the tractor fuel tank (See Figure 33). Suction hose is shown as illustration as it will be installed later.

Figure 38

22. Install Hose support rings to RH side mount Plate. Install the hose support rings to the RH side to support the pump presure hoses (See Figure 41). These will be welded to the plate. On the Pressure hoses there will be two, one to the cuppter valve (the large hose) and one to the cylinder control valve (the small hose. The hose should be tied together using plastic ties after run through the hose support rings.

Figure 39

23. Check to make certain bolts for axle stabilizer are tight. These bolts must be tightened securely, always recheck them. (See Figure 40)

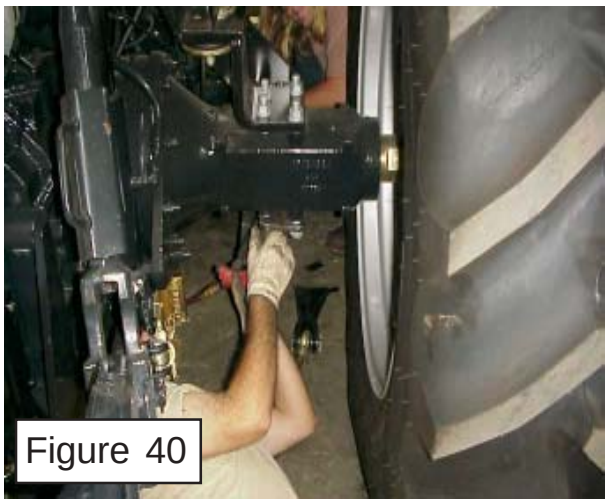
Figure 40

Figure 41

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24. Motor Hose Requirements. The Motor hoses will be attached to the head when they are received (See Figure 42). There are elbows connecting the hoses to the motor. On the 4 wheel drive is is IMPORTANT as to how these elbows are turned as the front tires will hit them if they are turned wrong (See Figure 43). Note the back elbow is the way it was sent from the factory and will be ok on two wheel drive. BUT ON 4 WHEEL DRIVE the elbow MUST be turned as shown (See Figure 43) to clear the front wheel.

25. Hose must be through the Hose Ring on Frame. The Motor hose must be run through the hose ring (See Figure 44) on lift frame before connectint them th the cutter valve (See Figure 45). The elbows on the cutter valve should be turned as shown (See Figure 45).

Figure 42

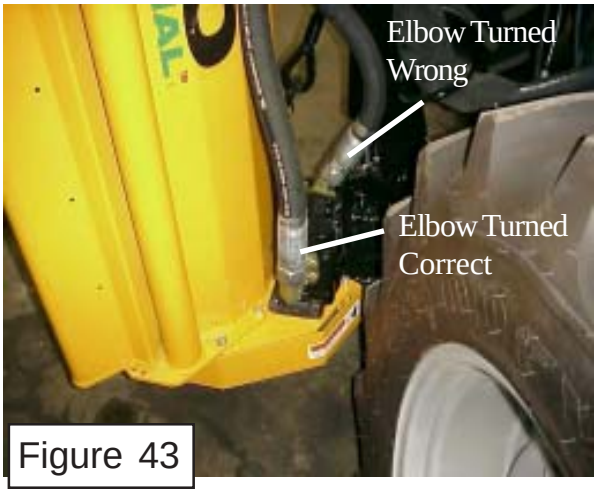

Figure 43

Figure 44

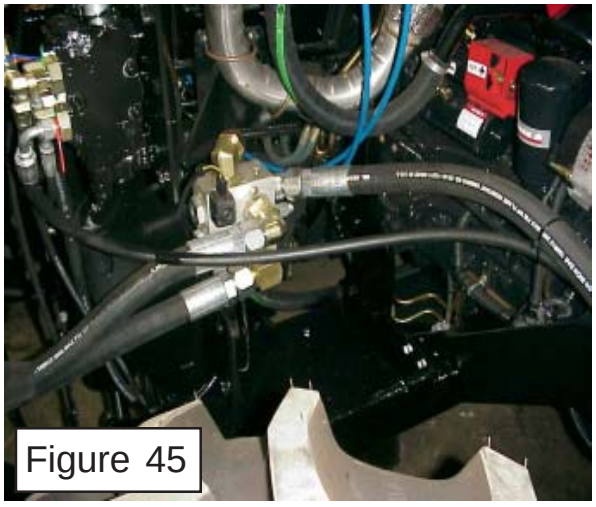

Figure 45

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Section 4

VERSA FLAIL

Pump, Driveshaft, Cyl. Control Valve & Cutter Valve

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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Pump & Driveshaft

Installing Pump, Pump Drive Components and Hydraulic Tank:

This Section covers the installation of Pump Drive Components, Pump Assembly and the Hydraulic Tank. Some precautions must be followed during the Assembly Process and before unit is ever started for the first time.

1. Tractor must be disabled to prevent accidental engine start and prevent damage to components.
2. All Fittings, Hose, Cylinders, Tank must be kept plugged at all times, No part of the Hydraulic System can be left open at any time during mounting process, this will keep system clean.
3. All Tools, Work Area, Components and Workers Hands must remain Clean when working on any part of the Hydraulic System.
4. All components should be rechecked for tightness at least twice, Hose routing also double checked.

Preparing Tractor Front Plate (Bolster) to Slide Driveline in From Engine Side :

1. Identify the front Bolster access holes. Remove the two rubber plugs that should be in the existing large holes of bolster. The Air Pre-Cooler lower plate can be removed if wanted. The shaft part of the driveline that has to slide in through the bolster from the engine side of the radiator, the flange yoke will be in so it can be connected to the pulley adapter (See Figure 1).

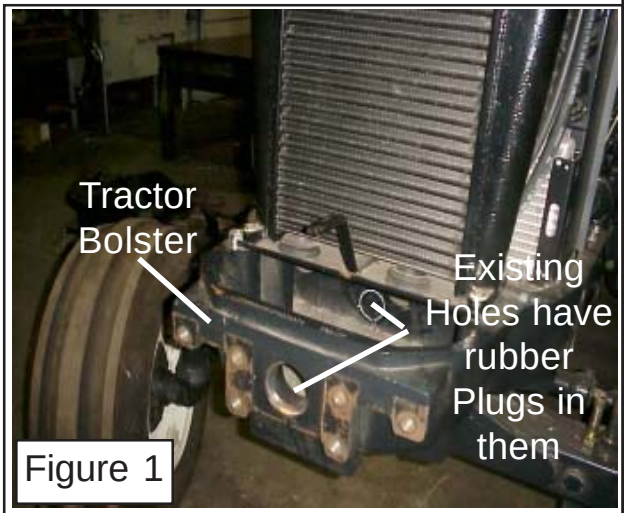

Figure 1

2. Install Pulley Adapter. The Pulley adapter (P/N 02980699) is a round plate with 4 threaded holes and four non-threaded holes in it. Notice this pulley adapter will not have a center hole in it **(See Figure 2).** The four non-threaded holes are used to mount the Adapter to the Crankshaft Pulley using bolts (P/N 02980720) 12 mm X 40 mm long and lockwashers (P/N 00754566) 12 mm that are supplied in mount kit. The four threaded holes are used to install the flange yoke of driveline to pulley adapter Do not use longer bolts to mount Pulley Adapter to Pulley or Flange yoke to adapter than are supplied with mounting kit, if longer bolts are used they could go through adapter and pulley causing damage. Tighten the four bolts that retain the pulley adapter to the pulley now, it will be easier than trying to tighten them later.

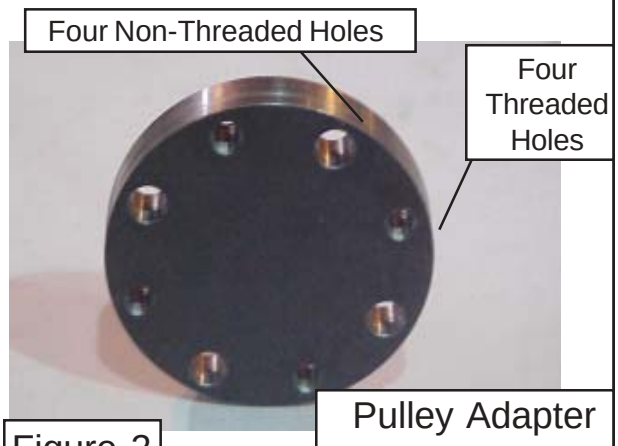

Figure 2

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3. Install Shaft Half of Driveline with Flange Yoke. Note the driveline universal joints should be timed (See Figure 3). Slide the two driveline half assemblies apart and lay the tube half aside for now. Make certain that the four retaining bolts for the Pulley adapter to the crankshaft pulley have been tightened.

From the side of the tractor (RH side) slide the Shaft Half of driveline shaft end first down into the opening below the radiator from engine side, insert it through the existing hole and/or cut hole combination until the shaft is pointed toward the front of the tractor, and the flange yoke is over far enough to align with the four threaded pulley adapter holes.

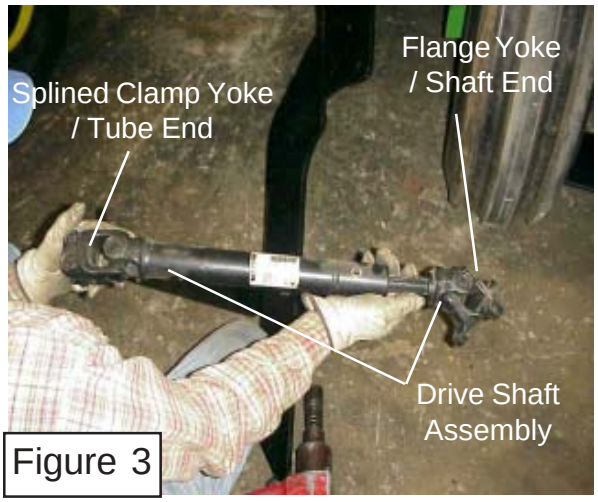

Figure 3

Align the four holes in the flange yoke of driveline with the four threaded holes in the pulley adapter. Install the four retaining 7/16" X 1-1/4" long bolts (P/N 02976344) and 7/16" lockwasher (P/N 00022200) into flange yoke into adapter, tighten them at this time. These four bolts can be tightened by using a long socket extension run through along side the driveline shaft.

Set the tube end of driveshaft aside for now as it will be installed later. But always remember the driveline universal joint must be aligned (timed) when assembling the driveline halves.

Installing Pump Mounting Weldment :

1. Install Pump Mounting Weldment. The Pump Mount Weldment (Asy. P/N 02980719 w/ cover) bolts to the front of the tractor bolster using four 20 mm X 45 mm long bolts (P/N 02975959) and 20 mm lockwashers (P/N 02971158) . Install the Pump Mounting Weldment (P/N 02980666) with the opening for the driveline cover up. Tighten the four mounting bolts now. (See Figure 4)

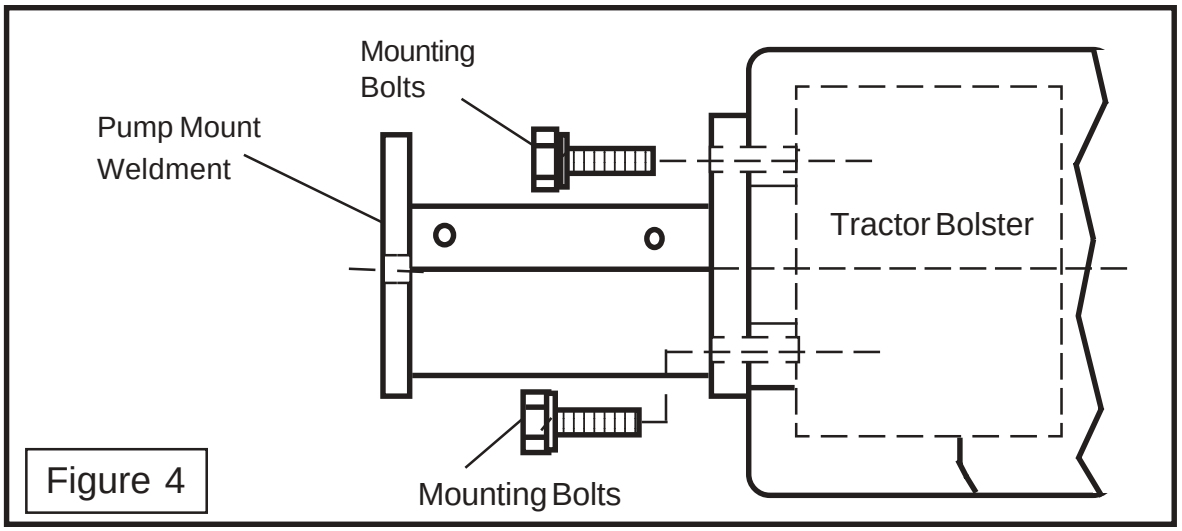

Figure 4

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Pump & Driveshaft

Installing Driveline Half to Pump :

1. Install Driveline Half to Pump. Install the clamp yoke of the tube half of driveline onto the pump, slide the clamp yoke on pump shaft until you have about 1/8" to 1/4" gap between yoke and pump. Do not install yoke so far on pump shaft that yoke will rub against pump in anyway. Tighten the two bolts and nuts on clamp yoke at this time. (See Figure 5)

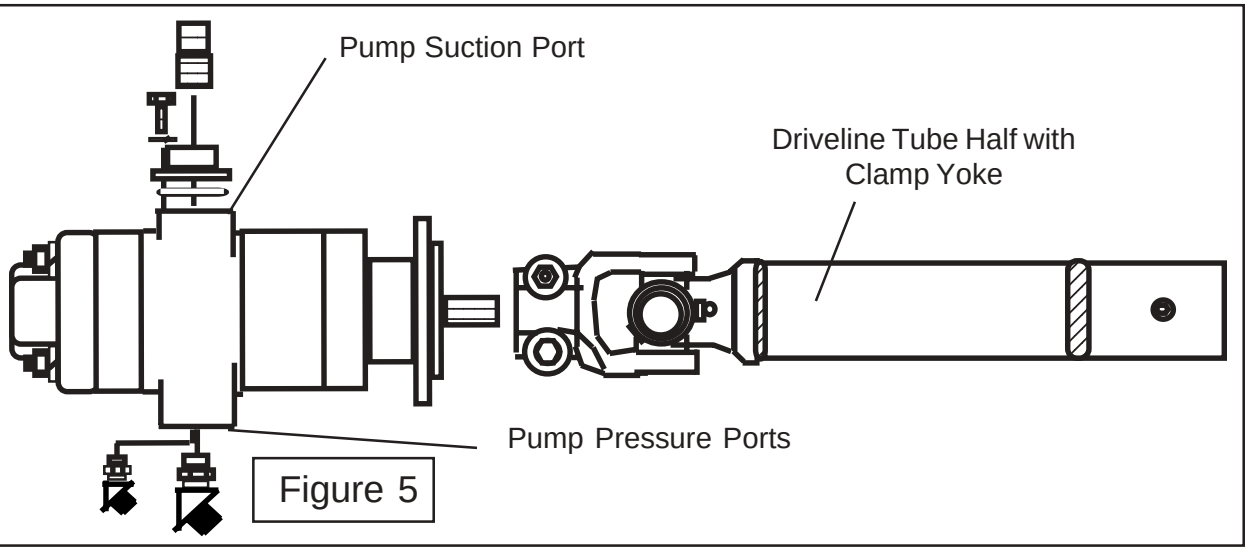

Figure 5

Installing Pump to Pump Mount Weldment :

1. Install Pump to Pump Mount Weldment. The Pump has the tube half of driveline attached and clamp yoke tightened. To install the pump and driveline half it is best to use an assistant or overhead hoist to help you align the drivelines halves as they are slid together, the Driveline **must** be timed (universal joints aligned the same) as shown in the pump & driveline schematic on (See Figure 6, 7, 8 & 9). Slide Driveline half and pump together until the shoulder on the pump slide in the hole on the pump mount weldment.

When installing the pump always keep ports sealed to keep them clean and free of contamination. The pump MUST be turned correctly. The suction Port (side with single port must be to the left side (sitting in tractor seat) so the suction hose will connect to it. The dual port side will be to the right side of tractor (as sitting in tractor seat). The top port on the right side is for the pressure feed to the motor on the cutting head. The bottom port on the right side is the pressure supply for the cylinder control valve. (See Figure 6).

Install the two 1/2" X 1-1/2" long pump mount bolts (P/N 02892000) and two 1/2" lockwashers (P/N 00001300). Tighten the two pump mounting bolts. **DO NOT Start Tractor after pump has been installed until all hydraulic connections have been made and filling will oil procedure has been completed. If tractor is started with pump dry it and the hydraulic system will be damaged.**

Installing Pump Driveline Cover :

1. Install Pump Driveline Cover. The Pump Driveline will have a cover (P/N 02980398) which retained by four 1/4" X 3/4" bolts (P/N 00021400), four 1/4" flatwashers (P/N 00024100) and four 1/4" lockwashers (P/N 00017000), install and tighten these now (See Figure 6).

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Pump & Driveshaft

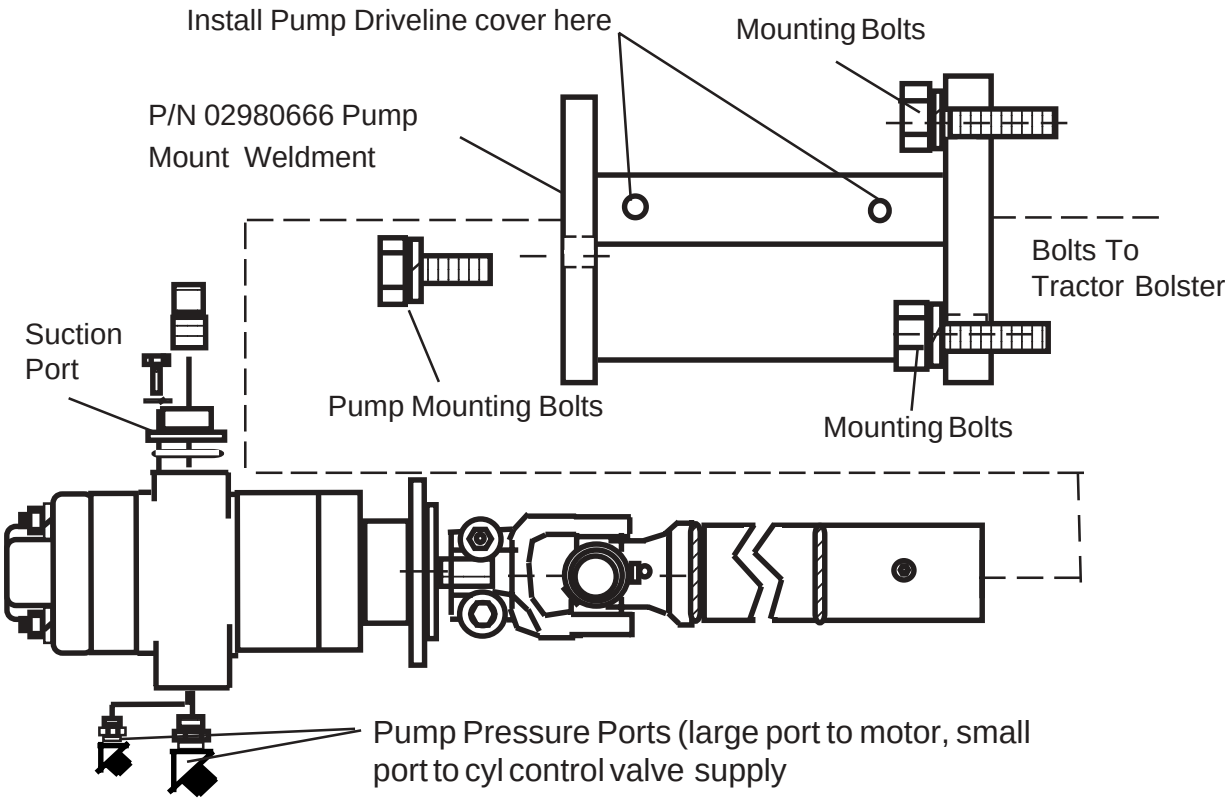
Install Pump Driveline cover here
Mounting Bolts
P/N 02980666 Pump Mount Weldment
Bolts To Tractor Bolster
Suction Port
Pump Mounting Bolts
Mounting Bolts
Pump Pressure Ports (large port to motor, small port to cyl control valve supply

Figure 6

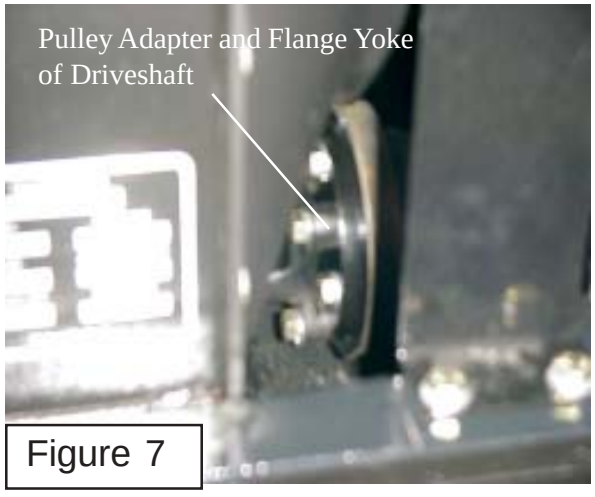

Figure 7

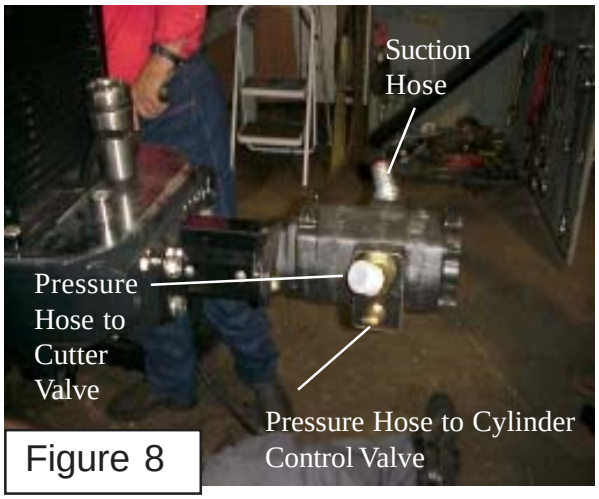

Figure 8

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Pump & Driveline Schematic

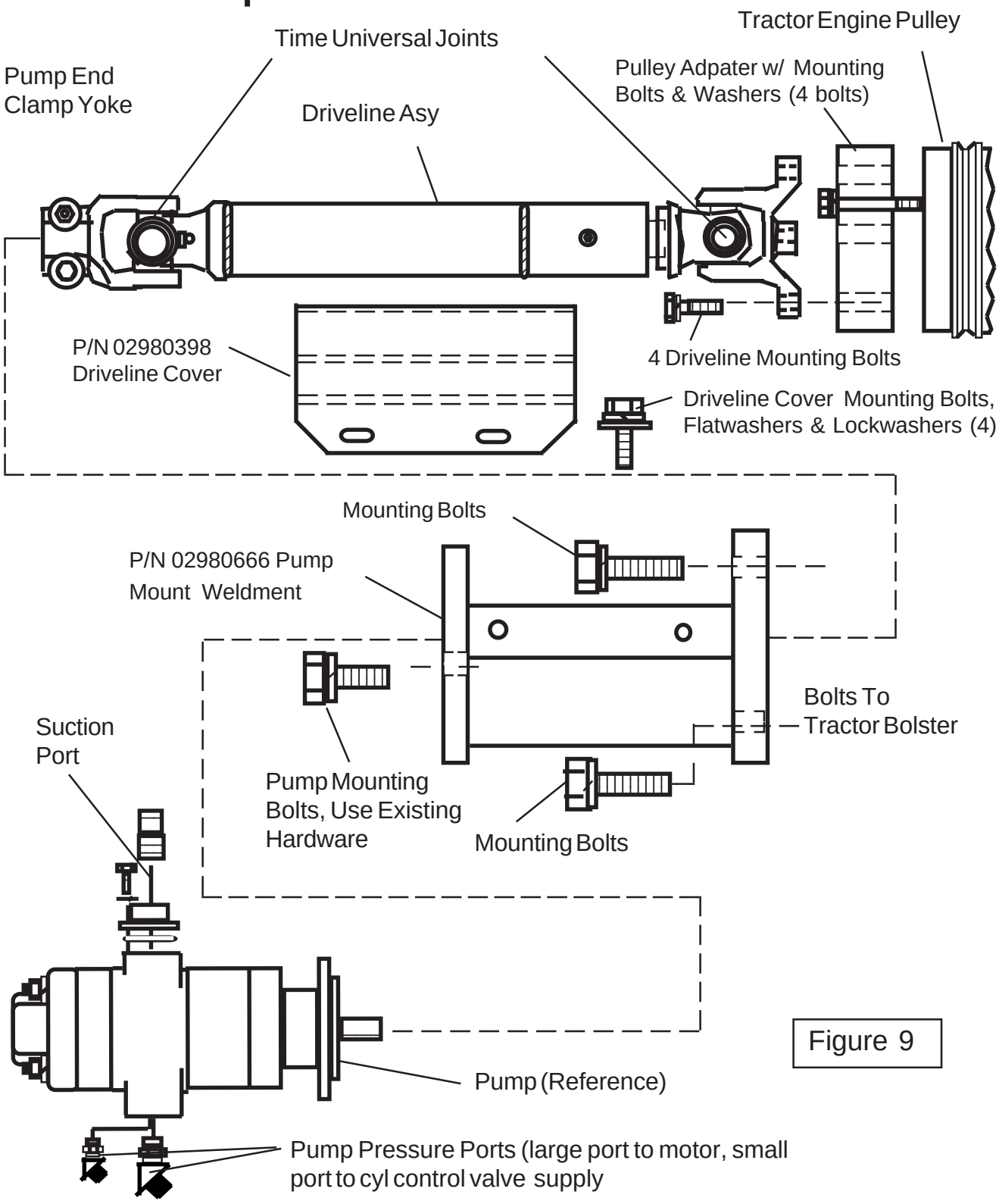

Figure 9

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Installing Pump Hoses :

1. Install Pump Hoses. The Pump hoses are connected to the cutter valve, the cylinder control valve and the hydraulic tank. The suction hose (LH side of pump will connect to the hose barb at the top of the hydraulic tank (See Figure 10 & 11). There are two hoses connected to the RH side of the pump, the pressure hose (top or larger hose at pump) goes to the cutter valve. The smaller or lower hose goes to the cylinder control valve as the pressure supply (See Figure 12 & 13), It is very important that these hoses do not get mixed up, damage will occur if hoses are connected wrong.

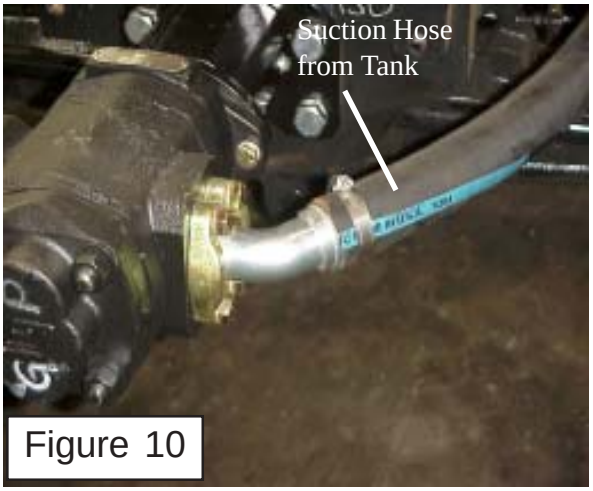

Figure 10

2. Connect Hoses to the Tank, Valve, Pump and Cylinders. Connect the hoses to the cylinders, valves and pump using the hydraulic schematic (See Figure 19). DO NOT unplug any hoses or fittings until you are ready to connect them, this will help to keep contamination out of system. When the Suction hose is connected to the tank DO NOT tighten the clamp as the hose will have to be removed when the tank is filled (See Figure 10 through 18).

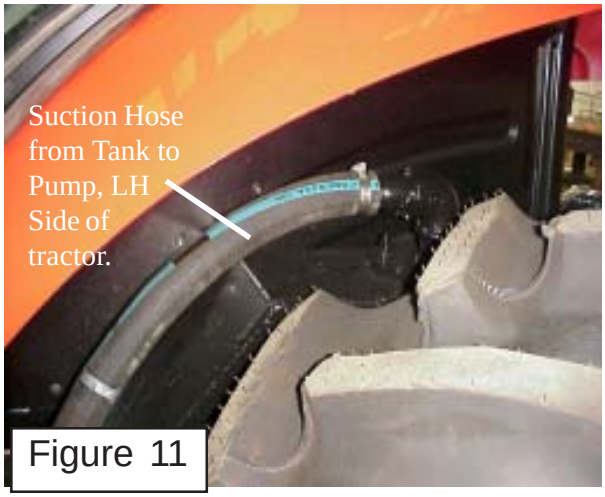

Figure 11

3. Cut Tip Off Return Pressure Gauge. The return pressure gauge has a rubbery tip on the top of it when manufactured, cut the tip as shown (See Figure 17).

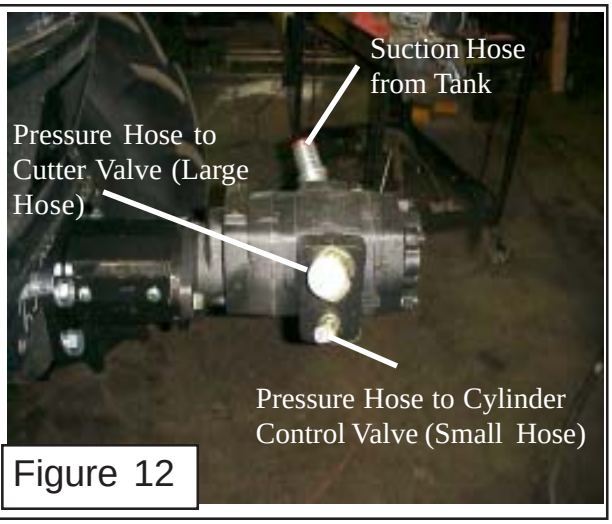

Figure 12

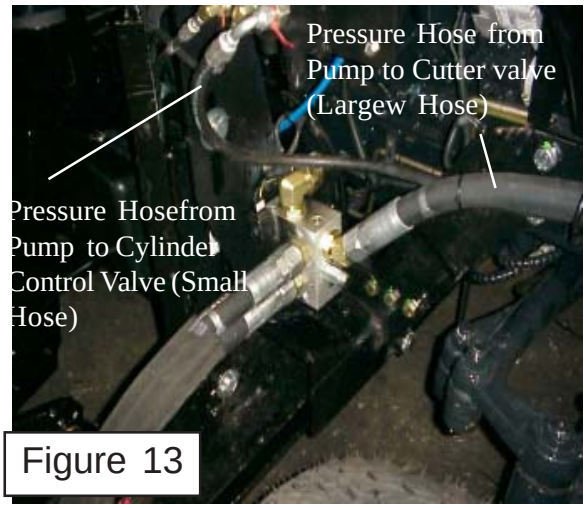

Figure 13

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Pump & Driveshaft

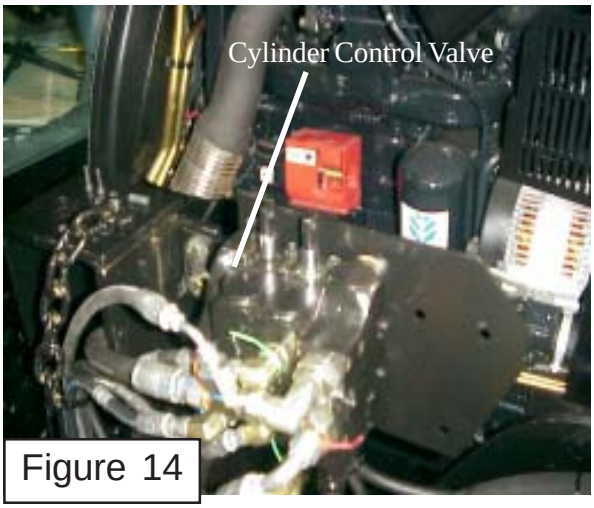

Figure 14

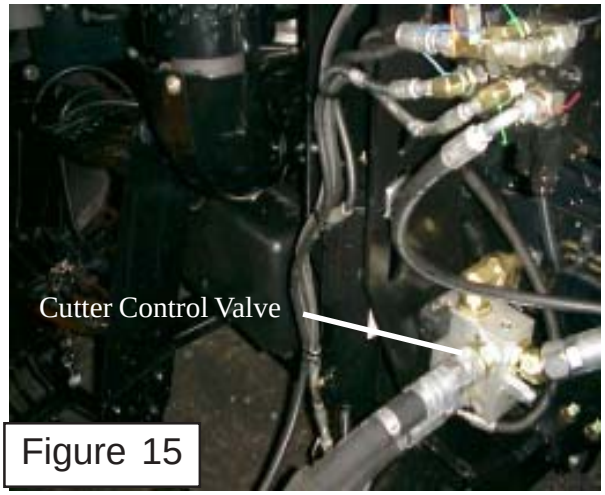

Figure 15

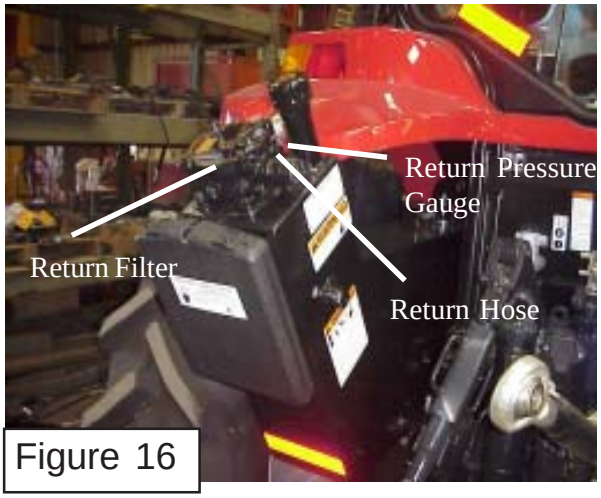

Figure 16

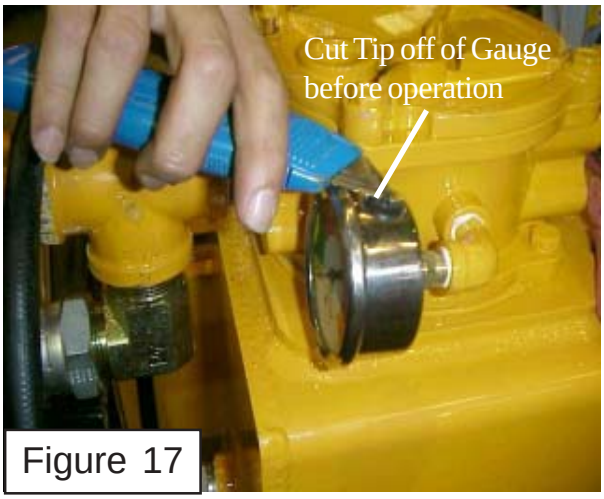

Figure 17

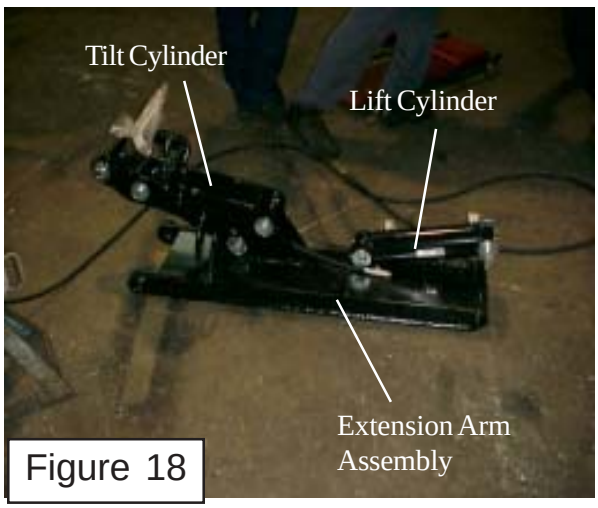

Figure 18

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Pump, Motor, Valves & Cylinder Schematic

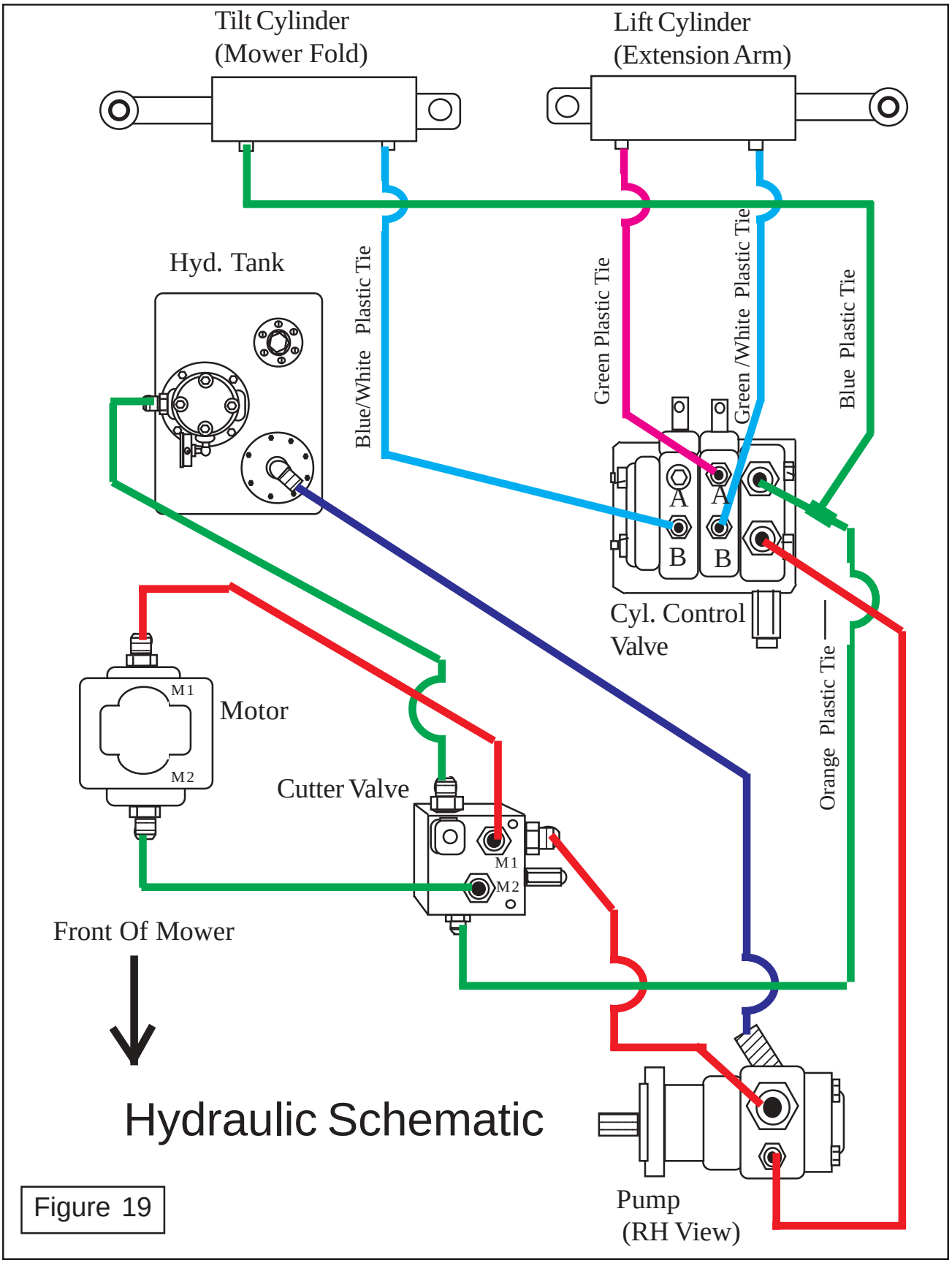

Figure 19

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Cylinder Control Valve

Mount Cylinder Control Valve :

1. Install Cylinder Control Valve to Frame. The Cylinder control valve bolts to the valve mount bracket (valve bolted to bracket from factory) which will be bolted to the frame by the installer (See Figure 20)

2. Cylinder Control Valve Hose Connections. Connect the hoses to the cylinders, valves and pump using the hydraulic schematic (See Figure 19). DO NOT unplug any hoses or fittings until you are ready to connect them, this will help to keep contamination out of system. IMPORTANT NOTE: All fittings must be connected as shown in schematic or controls will not function properly and can cause damage to valve or other components.

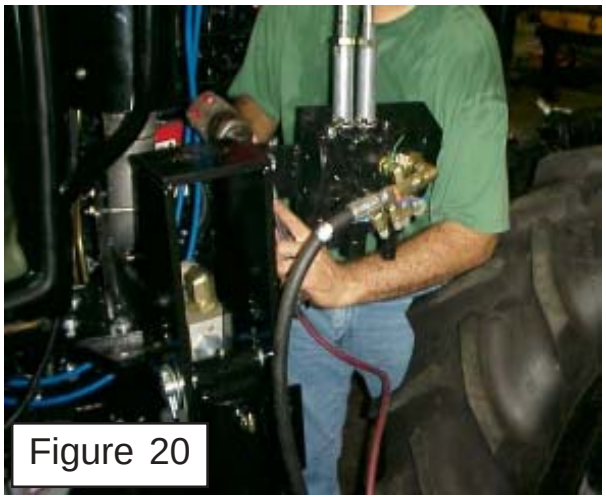

Figure 20

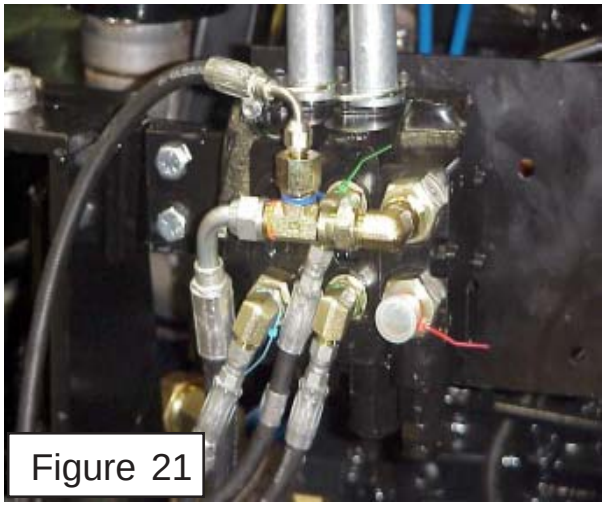

Figure 21

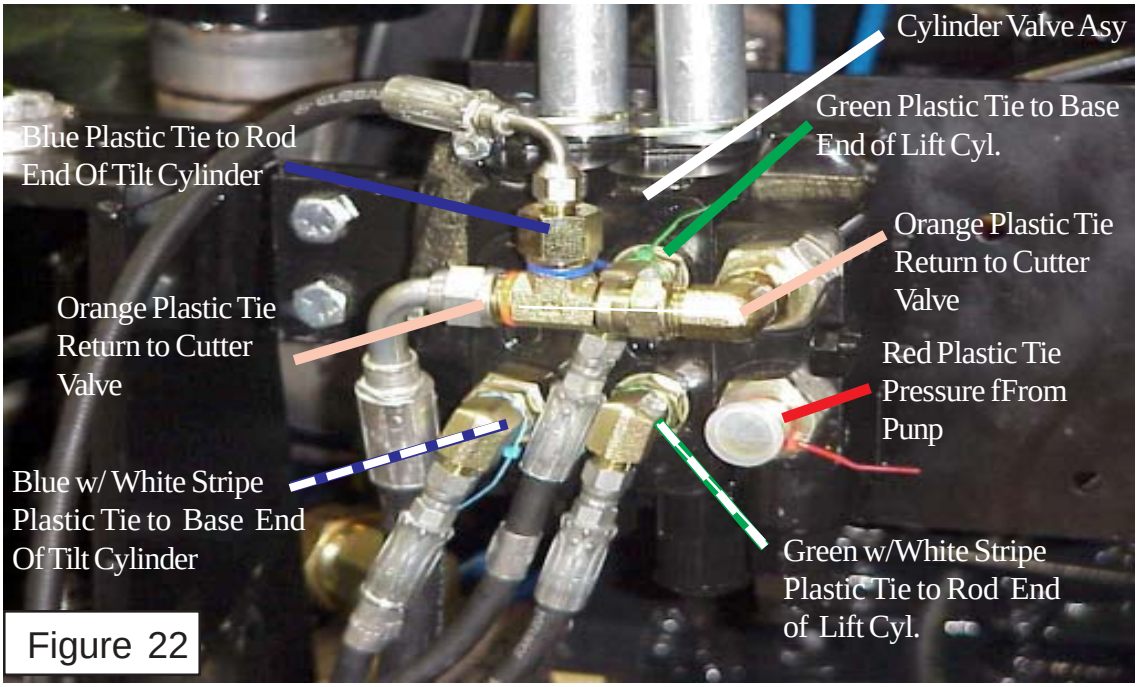
Cylinder Valve Asy
Green Plastic Tie to Base End of Lift Cyl.
Blue Plastic Tie to Rod End Of Tilt Cylinder
Orange Plastic Tie Return to Cutter Valve
Orange Plastic Tie Return to Cutter Valve
Red Plastic Tie Pressure fFrom Punp
Blue w/ White Stripe Plastic Tie to Base End Of Tilt Cylinder
Green w/White Stripe Plastic Tie to Rod End of Lift Cyl.

Figure 22

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Cutter Valve

Cutter Valve :

1. Install Cutter Valve to Frame. The Cutter control valve bolts to the frame on the RH side of the tractor (valve bolted to welded on bracket from factory), The cutter valve will have to be moved using the supplied bracket (P/N 02980990). This will move the cutter valve in and around the frame to where it is between frame and the engine (See Figure 23, 24 , 25 , 26 & 27). The Cutter Valve Ports to and from head motor are marked, the top port is stamped M1 and the lower port is stamped M2. The upper M1 is the pressure to the motor and the bottom M2 is return from the motor.

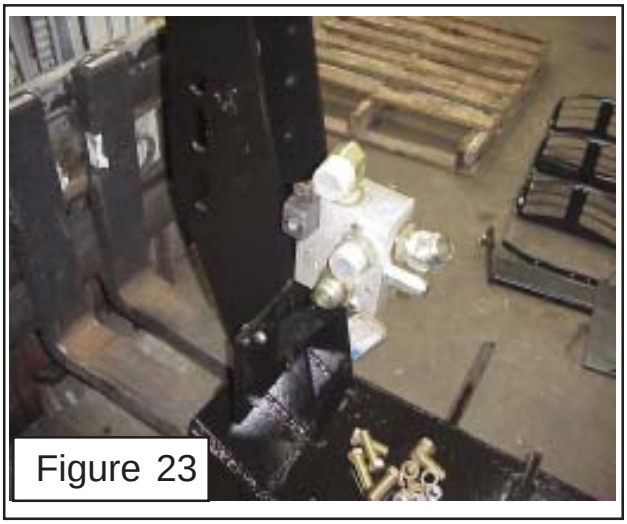

Figure 23

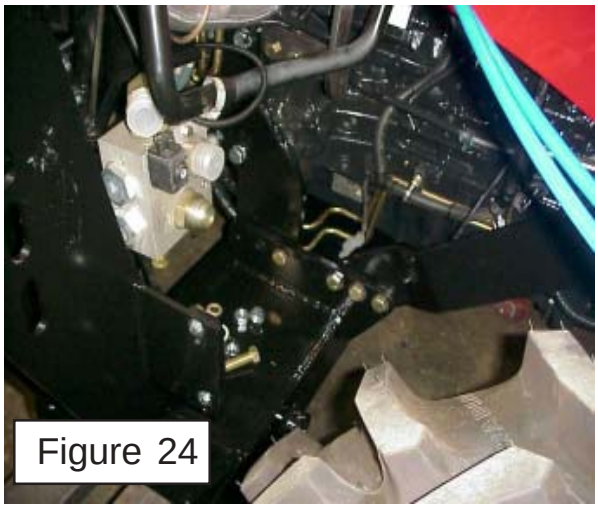

Figure 24

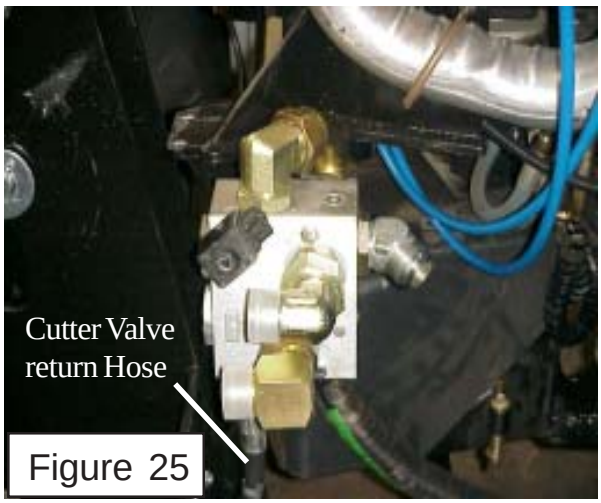

Figure 25

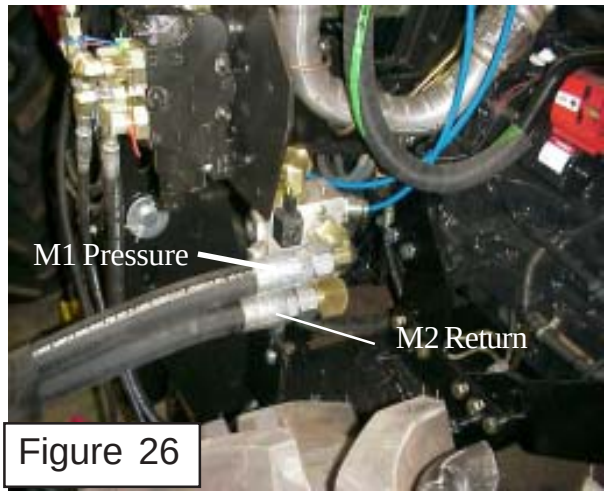

Figure 26

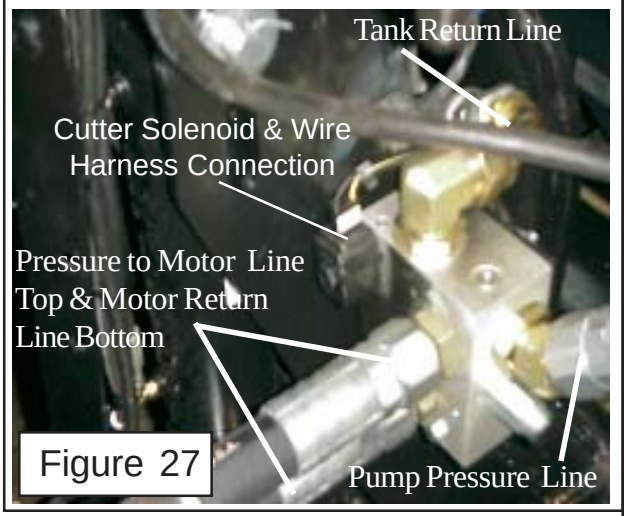

Figure 27

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NOTES

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Section 5

VERSA MOWER

Cylinder Control Valve and Cable Connections

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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Cylinder Control Cables

Cylinder Control Valve Cables To Valve Spools:

The Remote Control Cables Connection to the valve and the Control Handle assembly. See Figure 1 for listing of items (1 thru 8) listed in assembly steps.

1 Remove the phillps head screws that are in the valve body next to the spool end (8). There are bolts in kit that will be used to replace these screws when needed (See Figure 2).

2. Slide the Bolt flange (8)

3. Thread .750-16 NF jam nut entire length of threaded hub and onto the cable (7).

4. Place flange on sleeve and thread flange / sleeve assembly entire length of threaded hub and onto cable (2 & 6).

5. Thread .250-28 NF jam nut onto cable threaded rod until it bottoms (3).

6. Place connector onto threaded rod and against jam nut. Align connector so it will mate with spool terminal and secure jam nut against connector (4).

7. Slide the connector onto spool and align the holes. Insert pin through connector and spool holes (5). The control cables will need to inserted through the floor of the tractor cab and the Control Levers will need to be assembled to the cables before continuing with the next assembly steps.

8. With cable attached to the valve and control levers, turn the flange / sleeve assembly onto the threaded hub until it is flush with the valve face. When turning the flange / sleeve assembly make certain that the control levers remains in the neutral position.

9. Tighten the .750-16 NF jam nut against the sleeve to lock in position (6).

10. Bring flange into position and bolt assembly to valve housing. Tighten screws sufficiently to flatten lockwashers / secure flange (8). Caution, overtightening flange bolts will distort flange.

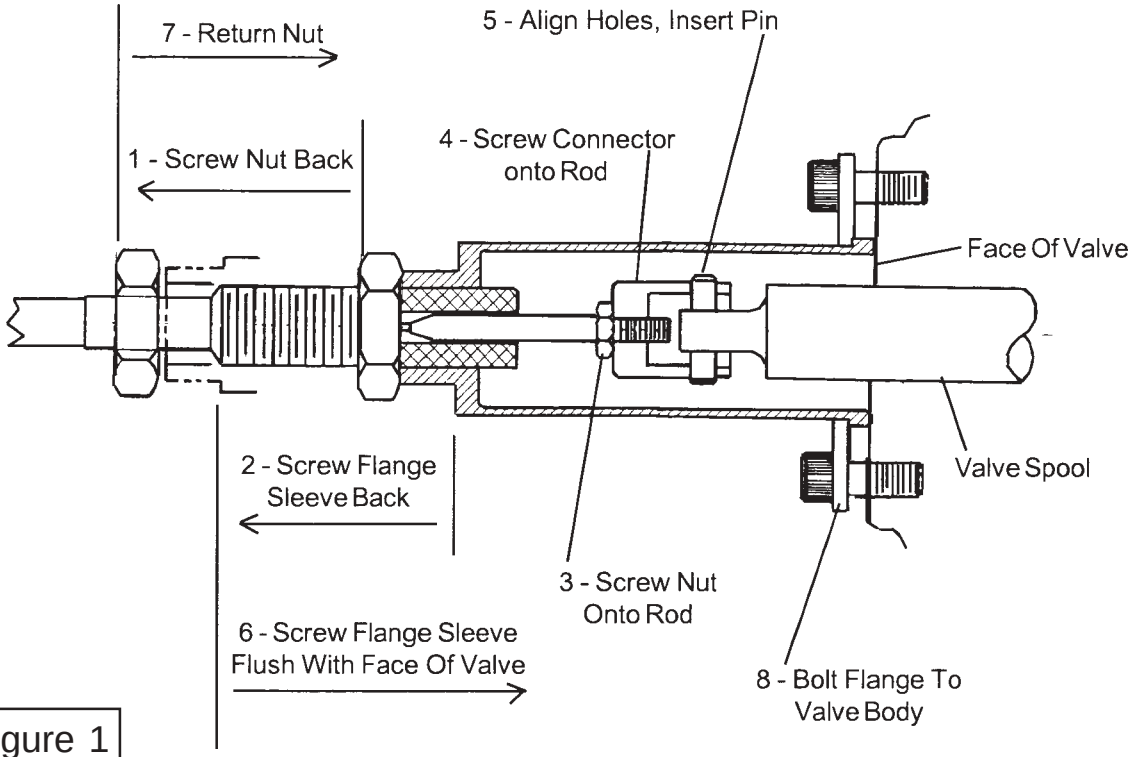
7 - Return Nut
5 - Align Holes, Insert Pin
1 - Screw Nut Back
4 - Screw Connector onto Rod
Face Of Valve
2 - Screw Flange Sleeve Back
Valve Spool
3 - Screw Nut Onto Rod
6 - Screw Flange Sleeve Flush With Face Of Valve
8 - Bolt Flange To Valve Body

Figure 1

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Cylinder Control Cables

Install Cable Controls in Tractor Cab:

1. Cut Hole in Floor of Tractor Cab. The cables and wire harness will run up through the floor of the cab. Cut a 2" hole using a 2" hole saw (See Figure 4). Where you cut the hole is to be determine by the technician installing the unit. Cut the hole where it is out of the way and will not interfere with any of the tractor or operator functions. Check under side of cab floor to make certain saw will not cut through any thing it should not. The Cabs rubber floor mat should be pulled up and out of the way while cutting the hole (See Figure 4).

2. Reinstall cabs Rubber Floor Mat. Put the rubber floor mat back down and into place (See Figure 5). Cut an X shaped cut in rubber mat above the 2" hole you cut in the floor. Install the wire harness through the cut hole in floor and through the cut in the rubber floor mat. The Cut Off Switch and fuse are connected to the wire harness on the inside of cab. (See Figure 5).

3. Insert Control Cables Through Hole in Floor of Tractor Cab. The cables (P/N 02971199 Qty 2 required) and wire harness will run up through the floor of the cab. Insert them from the under side of the floor and up through the floor and floor mat. If the Cable cover boot is used make certain that the four retaining screw do not screw into any thing under the floor mat or cab that will cause damage. Make certain to inspect before attempting to install the boot (See Figure 6).

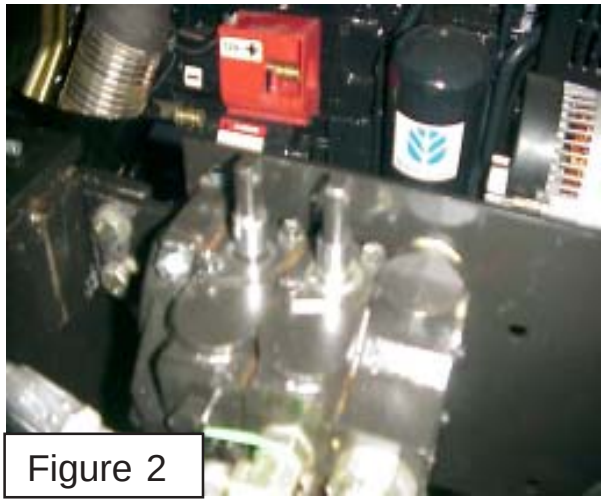

Figure 2

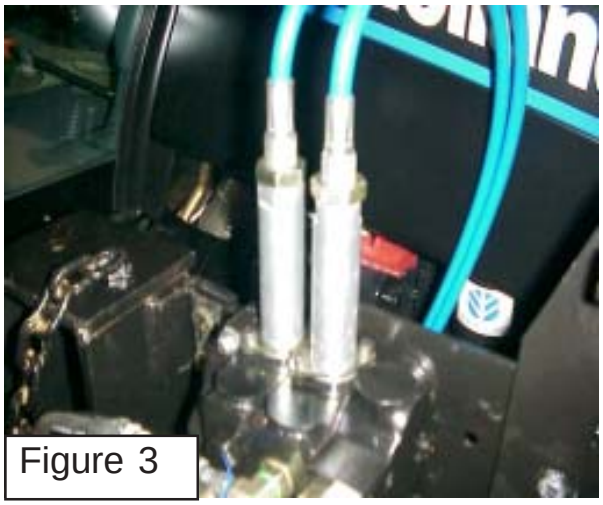

Figure 3

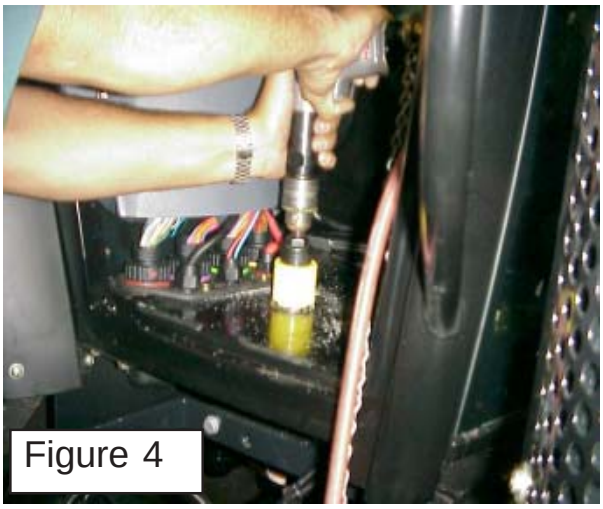

Figure 4

Figure 5

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Cylinder Control Cables

4. Install Cable Control Mount Bracket. Make certain that you mark the cables as to which is which on the control valve, this is important to make certain that the location will match the operating instruction decal. The Control Stick assembly can not be installed until the cables are run up through the cab floor. The cable control mounting bracket will mount to the cab door post on the right hand front side. There are four threaded holes in this cab door post. Hold the bracket up against the door post and determine the height that you want the control handles. Use the two holes that align with the bracket to mount it to the door post. (See Figure 7).

Figure 6

5. Control Stick Assembly. Remove the Cross- Screw_from the bottom of the Control Stick Assembly. DO NOT remove the screws that fasten the two housings halves together (See Figure 8).

6. Threaded Plunger Rod. While holding the housing, fully shift the Handle in the Control Stick Assembly to expose the female-threaded end of the Plunger Rod (See Figure 9).

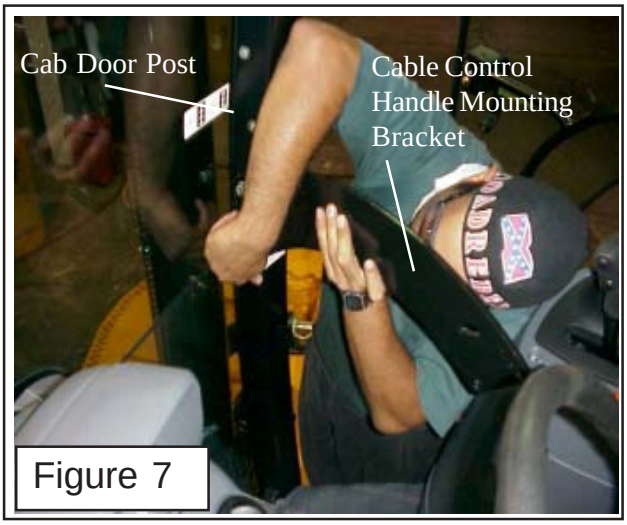

Figure 7

7. Threaded Cable End. While holding the Handle to expose the Plunger Rod, thread the Threaded Bead of the Cable into the end of the Plunger Rod and tighten securely. Release the Handle, allowing the Cable to pull into the Control Stick Assembly (See Figure 10).

8. Attach Cable To Plunger. Once Cable is attached to Plunger Rod, slide the silver Conduit Sleeve into the bottom of the Control Stick Assembly and align the groove in the Conduit Sleeve with the Cross-Screw Hole (See Figure 11)

9. Reinstall Cross - Screw. Install the Cross-Screw and tighten securely. Work the Handle to make certain the cable is moving freely and not binding (See Figure 12).

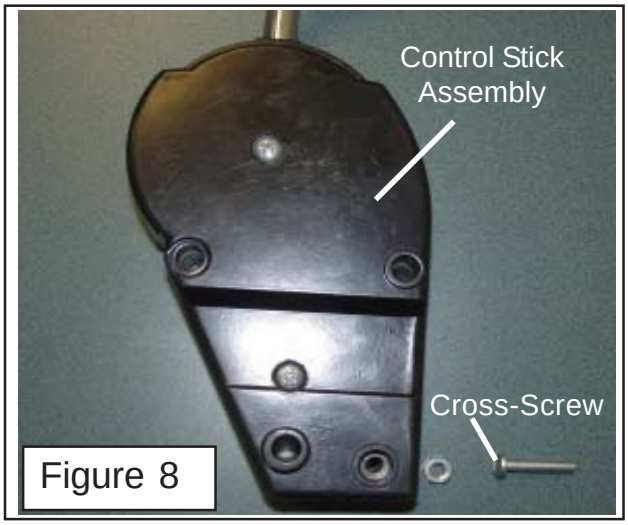

Figure 8

10. Connect Control Stick to Cab Mount. The control Sticks will be mounted to the cab mounting bracket with three bolts. These same three bolts will also mount the motor cut off switch mounting bracket. First insert the three bolts through the control stick for the Lift Cylinder operation. Second insert through the control stick for Tilt Cylinder control. Third insert the Cut off Switch mounting Bracket over the three bolts, The Motor cut off switch can be mounted else where if wanted, mounting here is a recommendation (See Figure 13).

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Cylinder Control Cables

11. Adjust the Control Handles to a Neutral Position. The Handles can be adjusted to a neutral position by going to the control valve. Loosen the flange bolts and the jam nut at the top of the flange sleeve. Turn the flange sleeve and this will move the control handles. The will allow the control handles to be aligned evenly. Tighten the jam nut and flange bolts when the handles are adjusted to the desired position (See Figure 1)

12. Check the Three Retaining Bolts. The threaded portion of the three retaining bolts will stick out of ther nuts at the RH hand side of control handle mount, these can be cut off with a hack saw if desired.

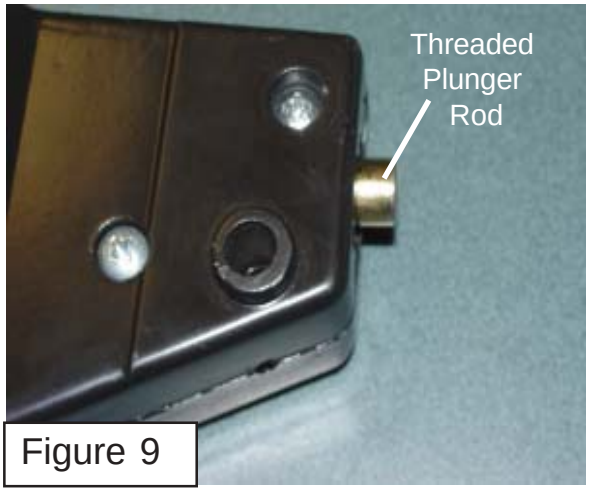

Figure 9

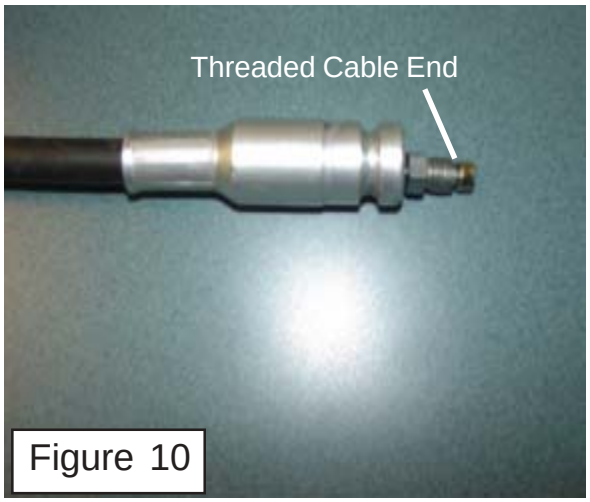

Figure 10

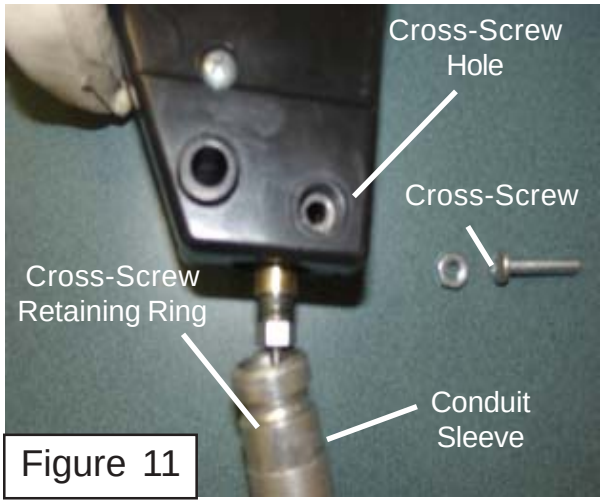

Figure 11

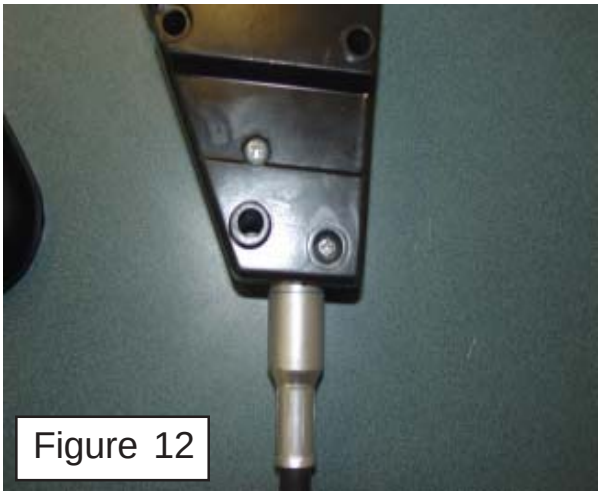
Figure 12

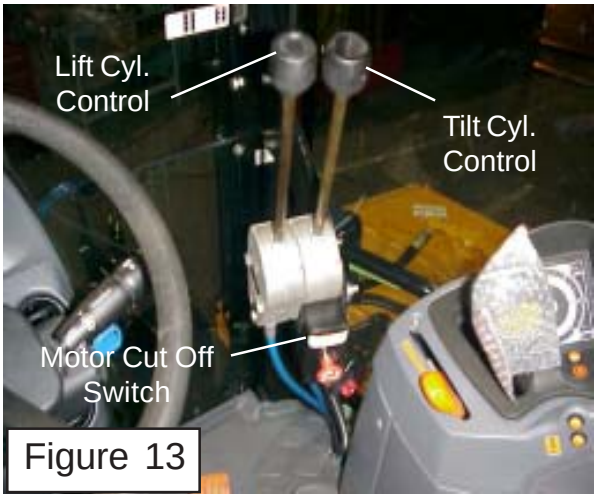

Figure 13

© 2004 Alamo Group Inc.

Cylinder Control Valve

1. **<u>The Control cables should be</u> installed and mounted to the stand already** (See Figure 14 & 15).

2. <u>Bolt Cylinder Control Valve Bracket with valve to MainFrame.</u> The Cylinder control valve will bolt to the mainframe (See Figure 16) and face outward toward cutter head.

3. <u>Reposition Hose Fittings in Valve.</u> The hose fittings are installed into the valvew from the factory, these fitting will have plastic ties to them with collor codes, some solid color and some will have white stripes on the same soled colors. Color example is Solid Green and Green with white stripe. These coded plastic ties designated which hose from valve goes to where, DO NOT change these color coded ties because it will change the way the valve functions. The Hose fittings can be change in direction they are pointing out of valve to make connecting hoses easier and neater (See Figure 17).

Figure 14

Figure 15

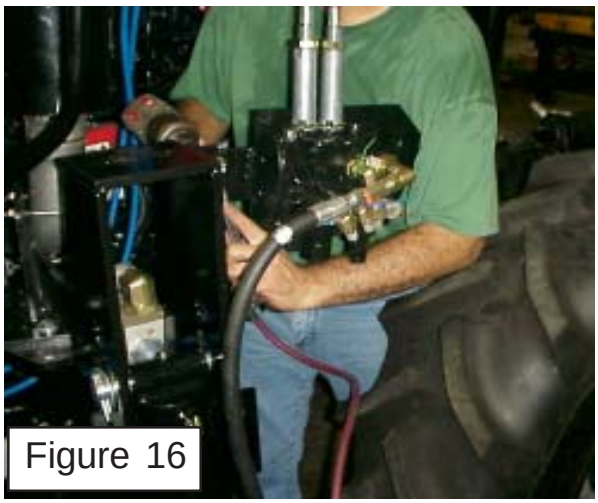

Figure 16

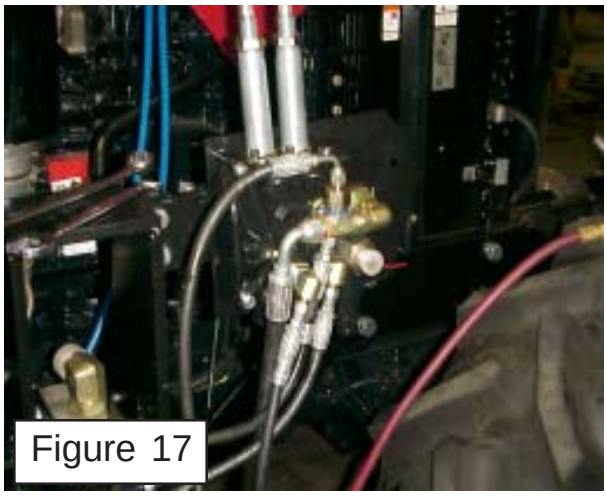

Figure 17

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Wiring Schematic

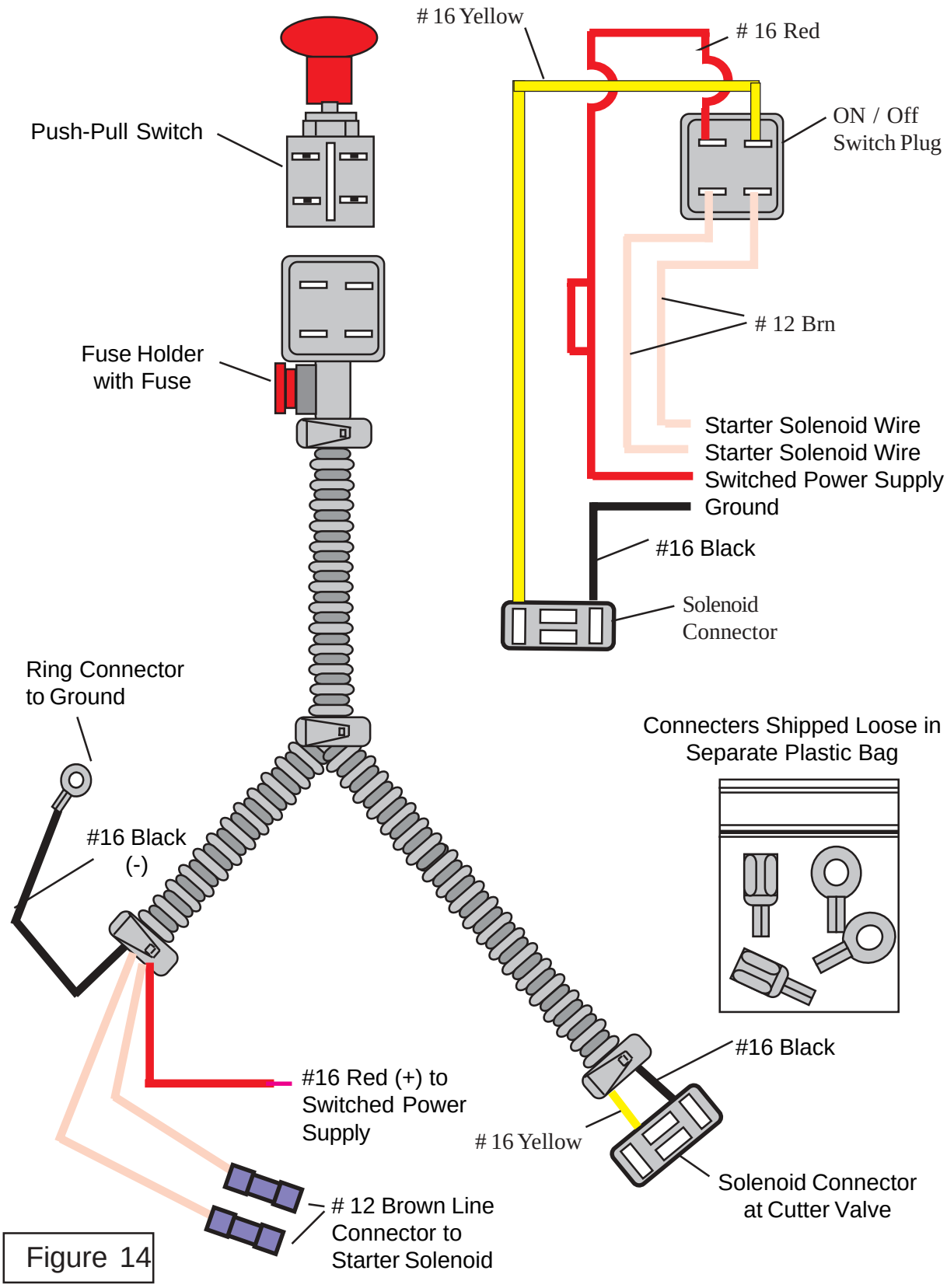

Figure 14

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Wiring Harness

Wire Harness Connections:

1. <u>Disconnect Battery Cable.</u> Disconnect the battery cables before attempting any of the electrical connections, this is to protect the tractor electrical system as well as the mower electrical connections. Electrical connections should never be attempted with the battery connected. Use Ohm Meters to test electrical connections.

2. <u>Wire Harness Schematic</u>. The wiring harness schematic list the plug, wire type, wire color, and where the wires connect. The wire harness will be shipped complete. The wire harness will need to be connected correctly or it will not function properly. DO NOT operate any unit that is not functioning correctly (See Figure 14).

3. <u>Connect Starter Solenoid Wires.</u> The starter solenoid wire are the two brown wires. The tractor solenoid activation wire will need to be cut and rerouted through these two brown wires. Connect the two wires at the starter solenoid (See Figure 14 & 15)

4. <u>Connect Wiring to Cutter Valve Solenoid.</u> The plug for the cutter valve solenoid will plug onto the solenoid without any modifications to plug or solenoid (See Figure 16)

5. <u>Connect Cutter switch electrical supply</u>. The red wire to power switch supply will be connected to a power supply that is only active when the ignition key is in the on position. Also make certain that it is connected to source that will not interfere with the switch or that the switch will interfere with other components of the tractor.

6. <u>Connect the Ground Wire</u>. The ground wire will need to be connected to the tractor where it will have a good uninterrupted connection.

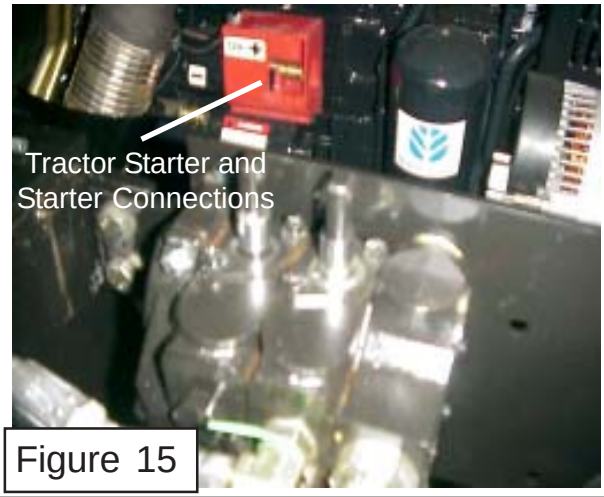

Figure 15

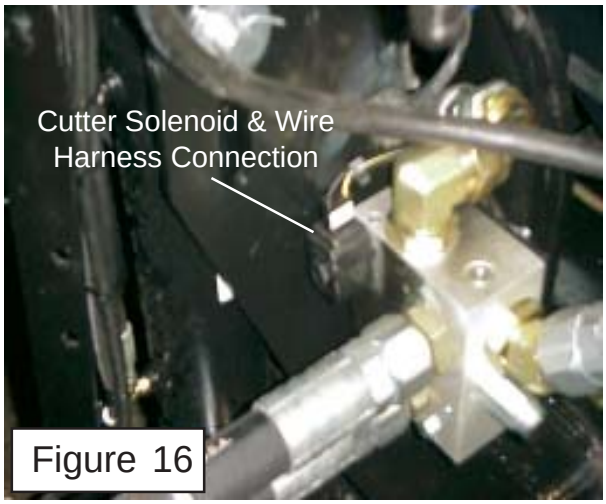

Figure 16

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Section 6

VERSA MOWER

Exhaust & Battery Modification

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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Exhaust & Battery Modification

Modify Exhaust on Tractor:

1. **Modify Tractor Factory Exhaust System.** The Exhaust of the tractor must be modified to move exhaust (muffler) in closer to the hood of tractor to give the Frame work clearance . This must be done before the frame is mounted.

2. Remove Old Exhaust System. The stock factory muffler is removed first, this will be saved as it will be reused after the exhaust pipe has been changed.

3. Remove Existing Exhaust Pipe & Existing Exhaust Mounting Bracket. There are bolts that hold the exhaust flange to the engine exhaust manifold, these will need to be remove completely. There is a stock mounting bracket located at the outer corner of the cab that supports the exhaust pipe. This bracket will be removed also. (See Figure 2). Lay the Bracket and exhaust pipe aside as the kit will include replacement Pipe, Bracket and Fasteners.

4. Exhaust Relocation Kit. The new Exhaust pipe, mount bracket, clamp and flange mounting bolt will be included in Exhaust Relocation Kit P/N 02980717

Part No.	Qty	Description
02980649	1	Exhaust Brkt Wldmnt
02980718	1	Turbo Down pipe Wldmnt
02980584	2	3" Exhaust Clamp Kit
02980727	4	Bolt, Skt Hd 8 mm X 35 mm
02980728	5	Bolt, Hex Hd 12 mm X 30 mm
701513C	5	Flat washer, 12 mm
00754566	5	Lockwasher, 12 mm

5. Install Exhaust Pipe. The new Exhaust pipe will come as a welded assembly (P/N 02980718) with a new flange and new bolts (P/N 02980727). Tighten the flange bolts that retain the down pipe to the exhaust manifold (See Figure 2).

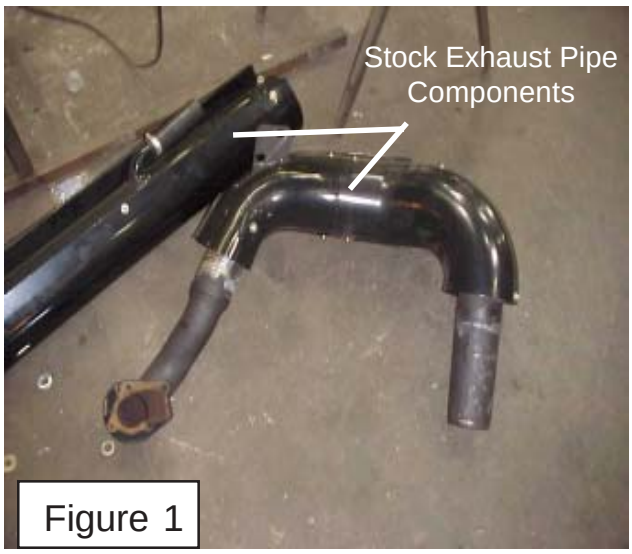
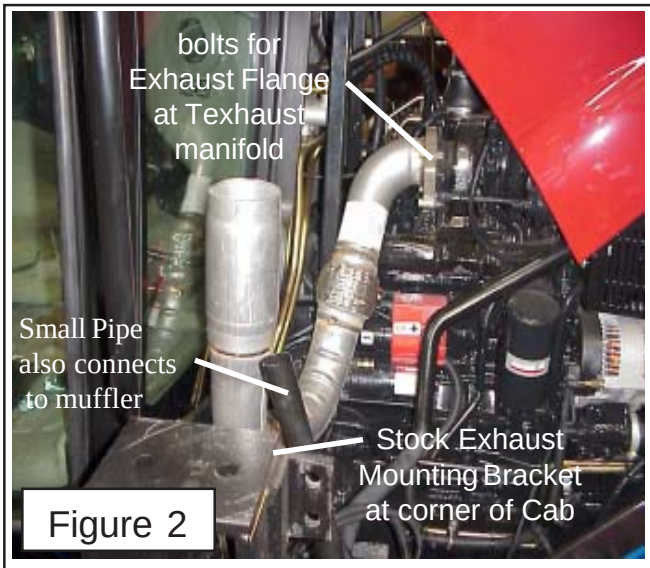


Figure 1


bolts for Exhaust Flange at Texhaust manifold
Small Pipe also connects to muffler
Stock Exhaust Mounting Bracket at corner of Cab
Figure 2

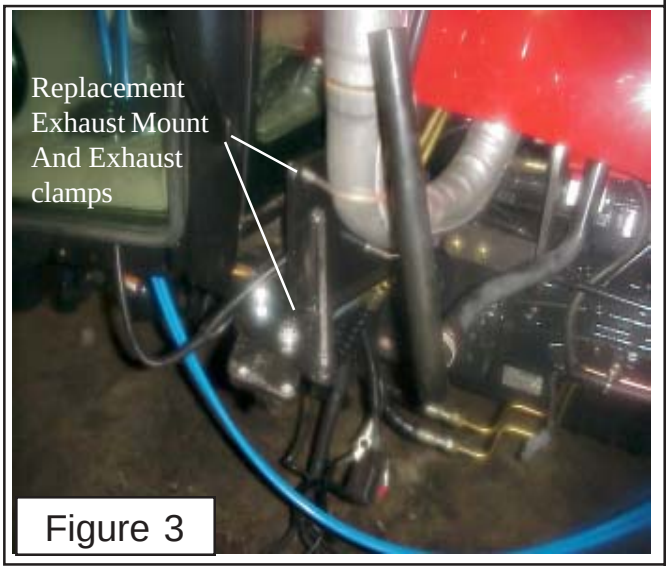


Figure 3

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Exhaust & Battery Modification

Modify Exhaust on Tractor: (continued)

6. Install Exhaust Mount Bracket. The new Exhaust mounting Bracket Weldment (See Figure 4 & 5 P/N 02980649) must be installed to mount the new Turbo Down pipe to using the 3" Clamp (P/N 02980584) to mount the Down pipe the new Exhaust mounting bracket. Note: The New Exhaust Bracket has slotted holes in it that are not shown in the angle that figure 4 is showing the weldment. There are 5 Bolts and lockwashers used to mount this weldment.

7. Reinstall Muffler. Reinstall the muffler using the existing hardware for the muffler. Turn the tip of the muffler toward the LH side of tractor as shown in Figure 6 if it is not already. Muffler should now be 8-1/2" inward from the stock location, this is a must for clearance of the frame . Note figure 6 shows thee high frame already installed, this is for reference only as the versa will not have this type frame and is for illustration only.

8. Muffler Clearance. Make certain that the hoses, wiring and other components are not touching the muffler. Make certain that all shields if any are replaced around muffler and exhaust pipe. On the case tractor there is a small line that will also connect to the muffler, make certain this line is reconnected when the muffler is installed (See Figure 2). This small metal pipe runs from the bottom of the air cleaner to the muffler and will have to be cut to fit new location of muffler. The easiest way is to cut the line and add another section of rubber hose to connect it back. The amount of and where it is to be cut should be determined by installer and the section of hose will need to be supplied local. (See Figures 5, 7 & 8)

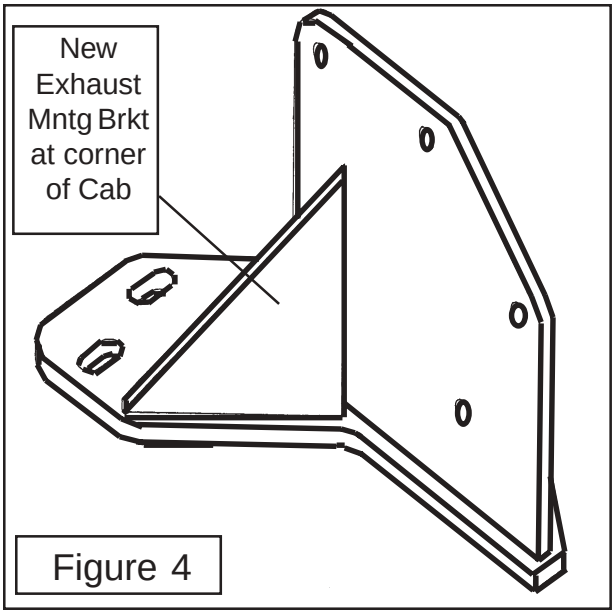

Figure 4

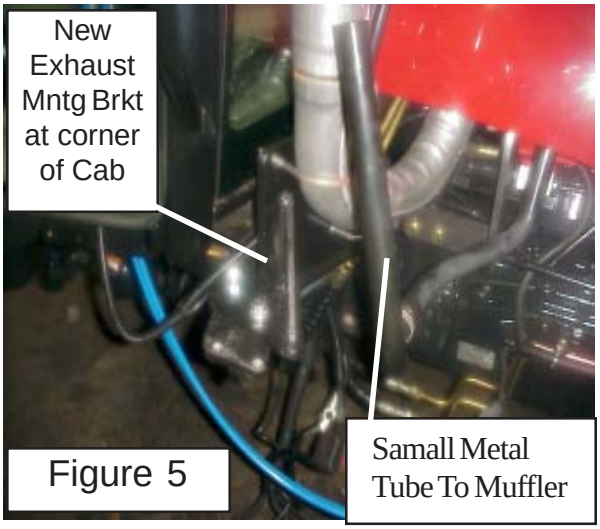

Figure 5

Figure 6

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Exhaust & Battery Modification

Modify Exhaust on Tractor: (continued)

9. Figure 4 and 5 Shows small tube from Air cleaner to muffler. This tube to be cut and reinstalled using additional piece of rubber hose and two clamps. This additional hose and clamps will need to obtained locally. Not all tractors will have this optional small running from air cleaner to muffler on it. (See Figure 4 & 5).

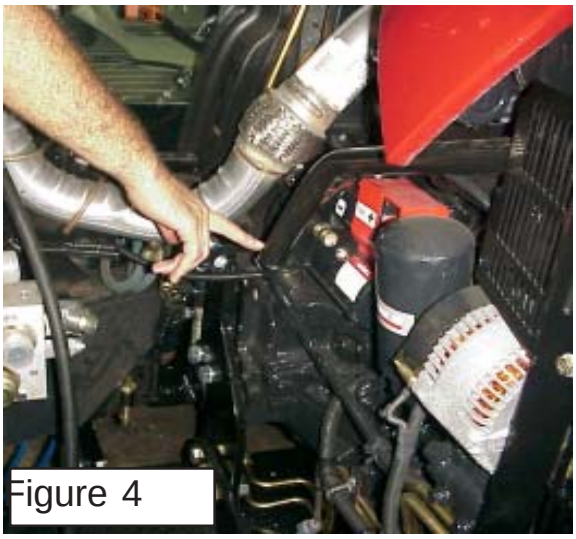

Figure 4

Figure 5

Modify Battery Bracket and Tray:

1. Remove Battery Cover , Battery and Battery mounting Tray / Brackets. (See Figure 6 & 7) Use Battery relocation Kit P/N 02981750) Remove the battery cover from the battery box. Remove the battery from the tray. Remove the tray and the mounting bracket. Replace the bracket with battery relocation component supplied. Reinstall the battery and the battery components. The batter cables will have to run from the back up over the battery, the they are installed around the front of the battery the cover will not fit back on properly. This will relocated the battery for clearance reasons.

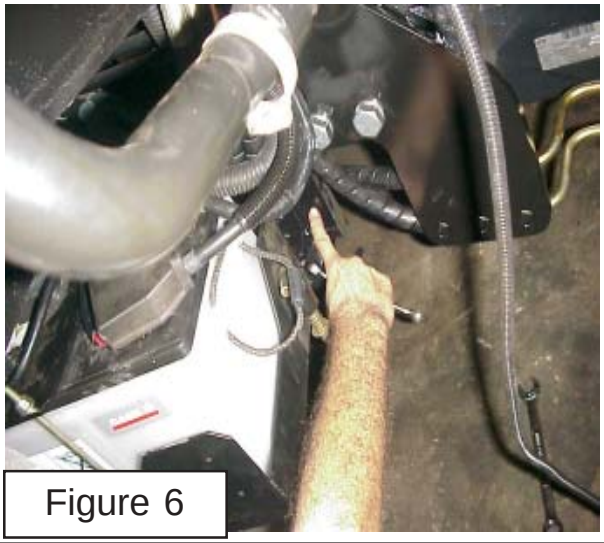

Figure 6

Figure 7

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Section 7

VERSA FLAIL

Optional Heads

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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Optional Heads Available

Versa Flail Mower Attachment (Optional Head) :

1. The basic mounting of the flail mower to the extension arm will be the same as the rotary head with exceptions that may be listed below.

2. With a Hydraulic Jack, raise the Extension Arm Assembly to a level position.

3. Using a Forklift or hoist, raise Versa Flail to the same height as the Extension Arm and move into position.

4. Fasten Versa Flail and Extension Arm together using Pin (Item 1 P/N 02959438), Bolt Item 2 P/N 10318000) and Nut Item 3 P/N 00001800). Attach the Linkage Arm Weldment to the Versa Mower with Shackle and Screw Pin (Item 4 P/N 02880200).

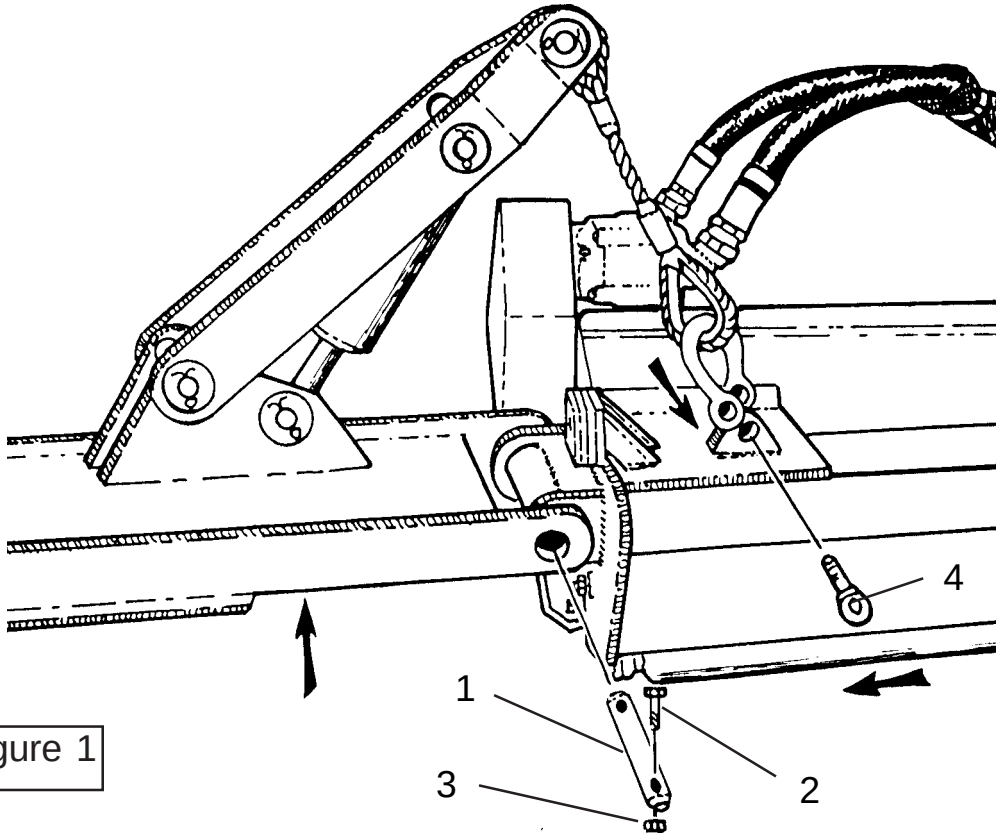

Figure 1

CAUTION! To prevent personal injury, always wear **SAFETY SHOES, SAFETY GLASSES**, and **GLOVES. A HARD HAT** should be worn by anyone working under a Crane Hoist or Block-and Tackle.

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Versa Flail Mower Attachment (Optional Head) Continued :

4. Attach Hydraulic Hoses as illustrated (See Figure 2) . NOTE: These hoses are to be routed through Top Pig Tail Bracket on Linkage Arm. Refer to your Operator's Manual and Parts Listing for part numbers and Hydraulic Schematic. Tighten any leaking Hydraulic Fittings. If fluid still leaks, loosen the fitting, apply a thread compound to the threads and tighten. Care must be taken when tightening Hydraulic Fittings. Too much tightening can cause the fittings to crack and require replacement fittings. Use recommended hose end torque values. See charts in general information section.

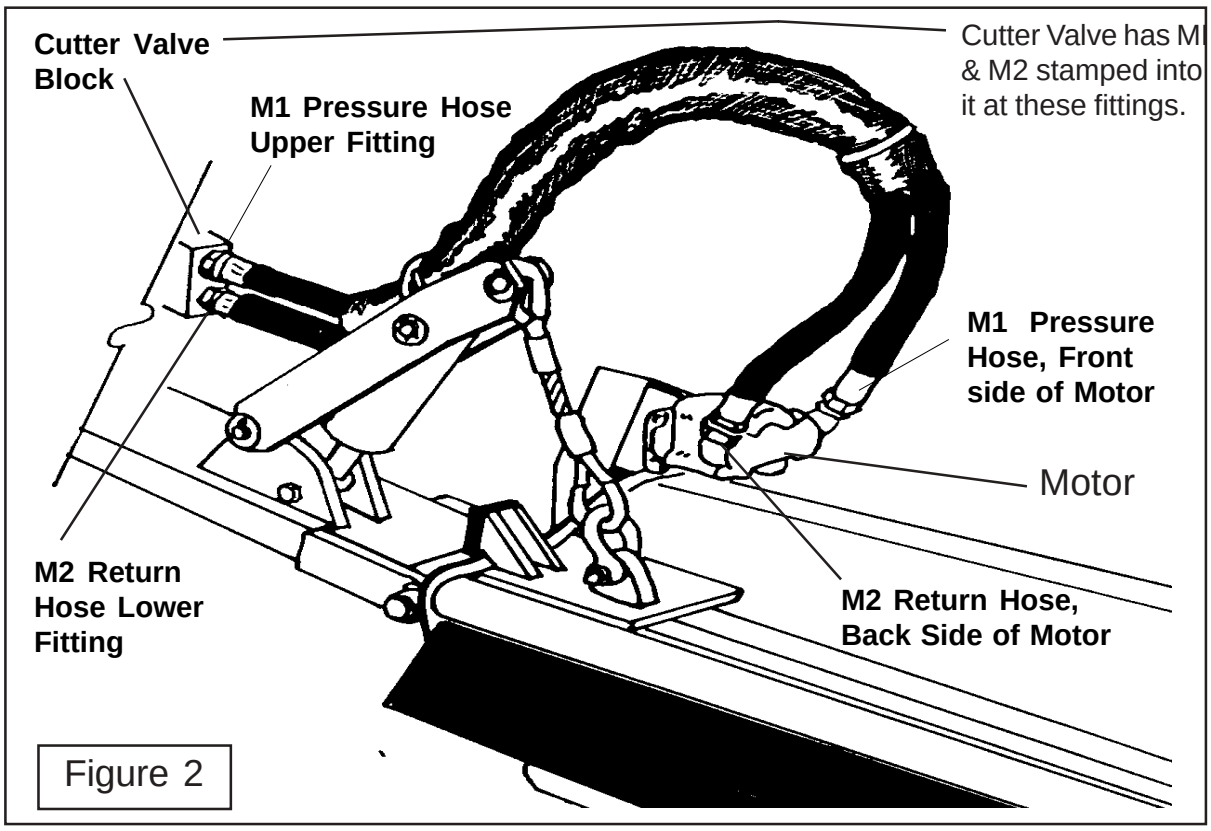
Cutter Valve Block
M1 Pressure Hose Upper Fitting
Cutter Valve has M1 & M2 stamped into it at these fittings.
M1 Pressure Hose, Front side of Motor
Motor
M2 Return Hose Lower Fitting
M2 Return Hose, Back Side of Motor

Figure 2

WARNING!

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks. If **ANY** fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

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Optional Heads Available

Versa Ditcher Head Attachment (Optional Head) :

1. With a Hydraulic Jack, raise the Extension Arm Assembly to a level position.

2. Using a Forklift, raise Versa Ditcher to the same height as the Extension Arm and move into position.

3. Fasten Versa Ditcher and Extension Arm together using Pin (Item 1 P/N 02880700), Bolt (Item 2 P/N 10318000) and Nut (Item 3 P/N 00001800). Attach the Linkage Arm Weldment to the Versa Ditcher with Shackle and Screw Pin (Item 4 P/N 02880200). (See Figure 3).

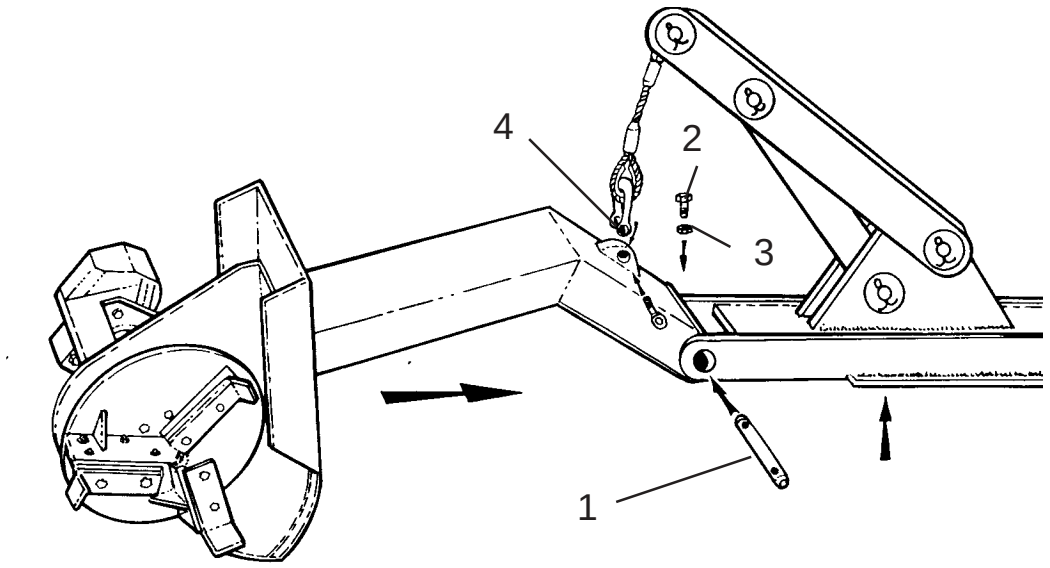

Figure 3

CAUTION!

To prevent personal injury, always wear **SAFETY SHOES, SAFETY GLASSES**, and **GLOVES. A HARD HAT** should be worn by anyone working under a Crane Hoist or Block-and Tackle.

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Versa Ditcher Head Attachment (Optional Head) continued :

4. Attach Hydraulic Hoses as illustrated (See Figure 3). Refer to your Operator's Manual and Parts Listing for part numbers and Hydraulic Schematic. Tighten any leaking Hydraulic Fittings. If fluid still leaks, loosen the fitting, apply a thread compound to the threads and tighten. Care must be taken when tightening Hydraulic Fittings. Too much tightening can cause the fittings to crack and require replacement fittings. Please use recommended hose end torque values. See Charts in General Information section or operators manual..

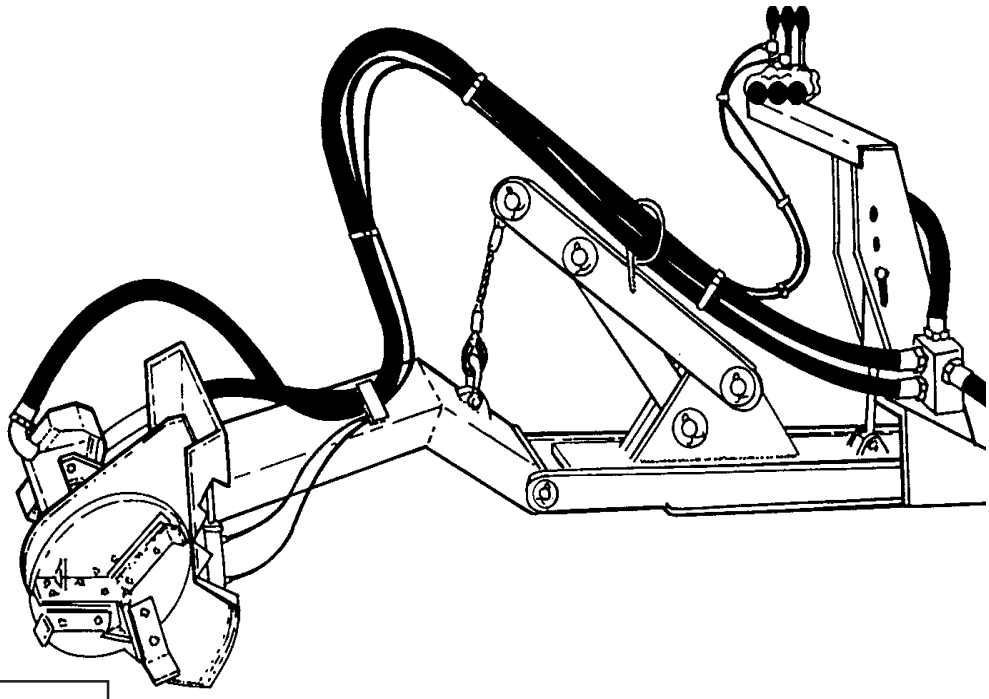

Figure 4

WARNING! Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks. If **ANY** fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

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Optional Heads Available

PREPARATION FOR INSTALLATION OF VERSA BOOM:

1. Temporally remove ROPS and fenders from tractor axle. Move left rear tire out so that it is 50 inches from the outside of left rear tire to the center of tractor. Then move the right rear tire out so that it is 96 inches between the outside of the left and right rear tires. Refer to your tractor's Operator's Manual for instructions on Rear Wheel Adjustment for your particular tire (See Figure 5)**.** Hydraflate rear left tire as much as needed for stability but stay in factory-recommend limit.

2. Extend front wheels as needed to provide clearance between tire and mounting brackets, tank & etc. (See Figure 6).

3. Install 00749117 Safety Decal on left fender or elsewhere clearly in operator's view.

WARNING!

Never operate the tractor with a loose wheel rim or disc. Always tighten nuts to the specified torque and at the recommended intervals.

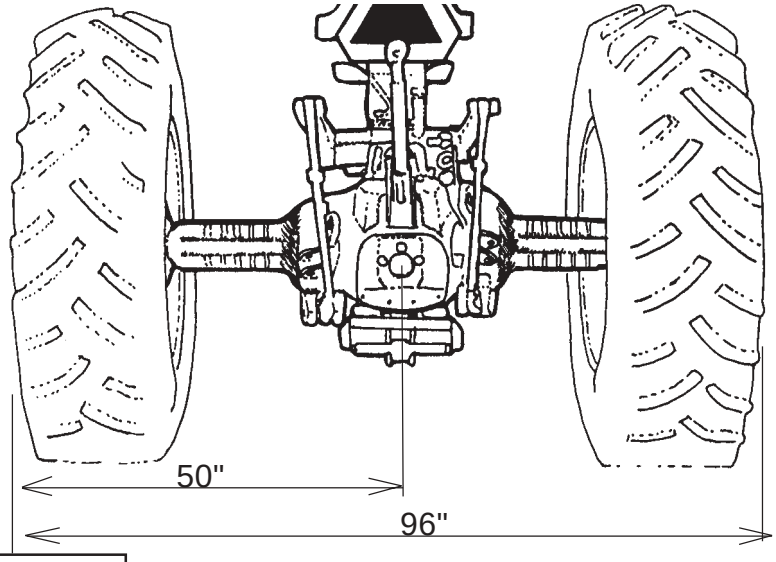

Figure 5

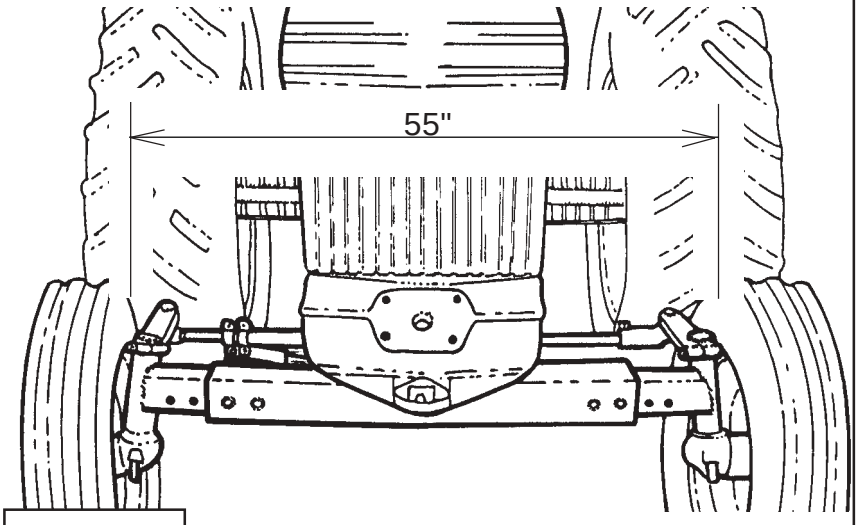

Figure 6

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PREPARATION FOR INSTALLATION OF VERSA BOOM: (continued)

NOTE:

If Versa Boom is being installed on a Versa Mower that is already in use, Extension Arm as well as Mower Head must be removed.

1. With a forklift or hoist raise Boom Mount Weldment and slide into Basic Tractor Mount Weldment. Insert pin into Boom Mount Weldment and Basic Tractor Mount Weldment. To prevent pin from backing out, attach bolt and nut in pin. Bolt top flanges of Boom Mount Weldment to vertical cylinder mount using hardware provided. Refer to your Installation Manual provided in your mount kit for part numbers and quantities (See Figure 7)**.**

2. Fasten counterweight to Basic Tractor Mount Weldment with fasteners called out on the Installation Manual (See Figure 8)**.**

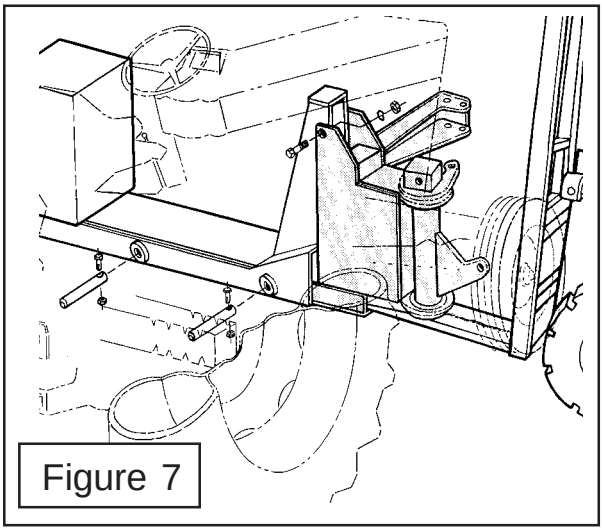

Figure 7

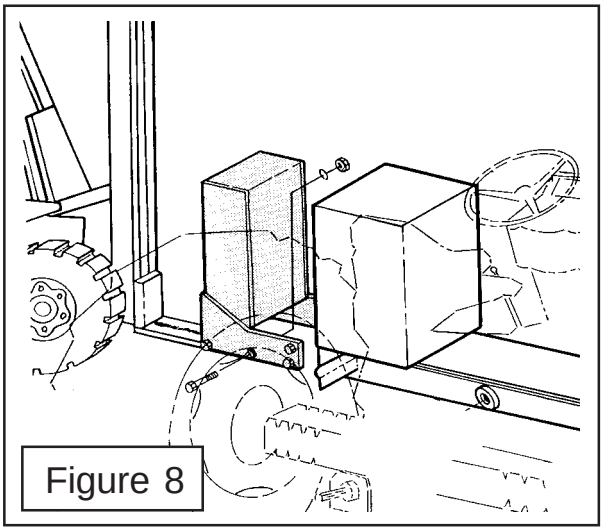

Figure 8

NOTE:

When installing a Versa Boom, additional counterweight (wheel weights, calcium chloride in tires etc.) must be installed to insure stability and safe operation.

3. To install the Axle Mount Weldment, attach Cage Axle Mount Brackets to Axle Mount Weldment with hardware provided in your Mount Kit. Attach Axle Mount Weldment and strap to Axle Mount to Tractor Axle with Hardware provided. Level axle mount weldment and weld to Boom Mount Weldment. Attach Valve Mount Weldment to Basic Tractor Mount with hardware provided. Refer to your Installation Drawing provided in your Mount Kit (See Figure 9).

4. To attach Versa Boom Cage Weldment, first lower Cage on tractor with a forklift or crane. Bolt Cage to Axle Mount using straps and hardware provided in your Mount Kit (See Figure 10)

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Optional Heads Available

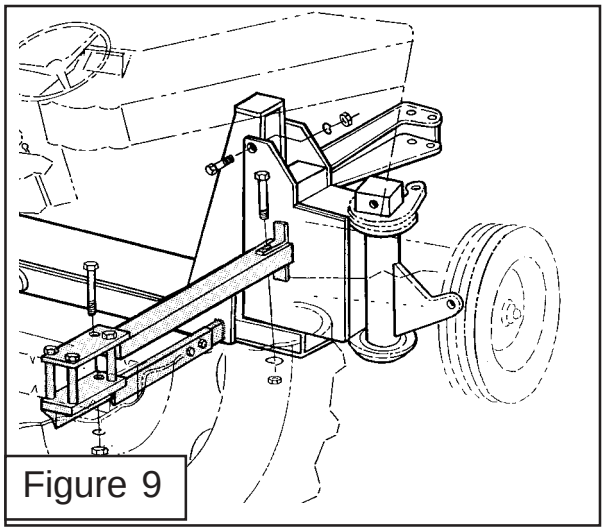

Figure 9

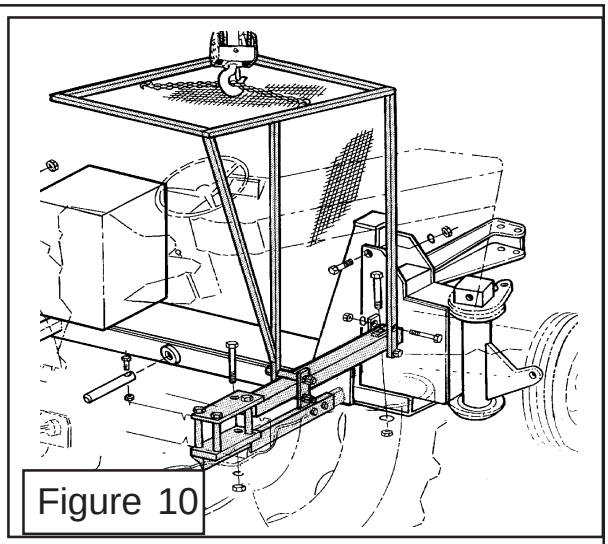

Figure 10

5. Attach Boom Rest to axle of tractor w/ fasten ers found in your Mount Kit. Refer to your Installation Drawing for part numbers and quantities (See Figure 11) Recommended torque chart for proper torque of bolts located in General Information Section..

6. With a forklift or hoist, raise the Boom Weldment and lower onto the King Post Turning Arm. Align the Boom Weldment and Turning Arm with an Aligning Pin. Insert Main Pin Bolt (P/N 02960837) into Boom Weldment and Turning Arm. Attach 1-1/8" lockwasher (p/n 00748000) and 1-1/8" nut (p/n 02921700) to bolt and tighten with a 1-11/16" wrench until Boom Plates firmly contact King Post. DO NOT OVER-TIGHT- EN. (See Figure 13) Note: Additional support may be needed at the end of the Boom to aid in installation.

Note: Hoses on 20', 22', & 23' Booms are shipped folded back inside Boom. Hoses must be routed in the end of Boom before installing Boom on the King P

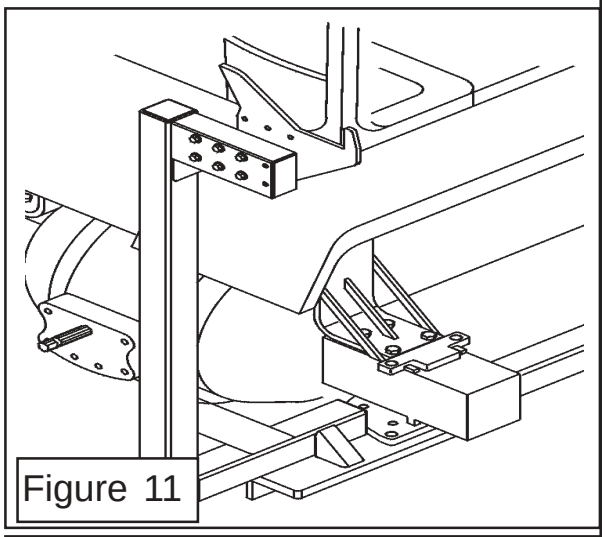

Figure 11

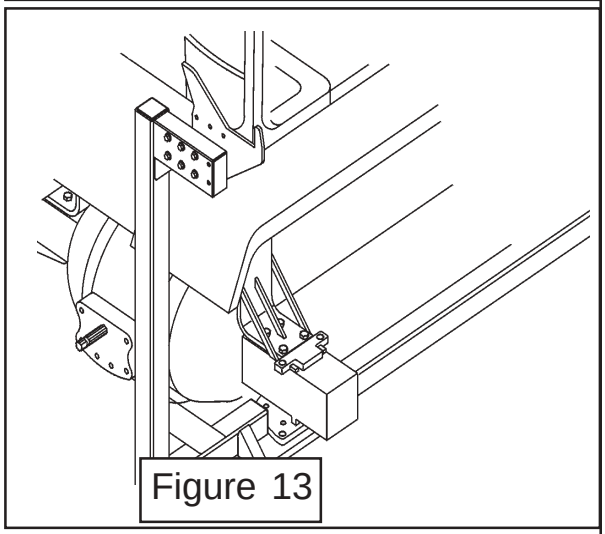

Figure 13

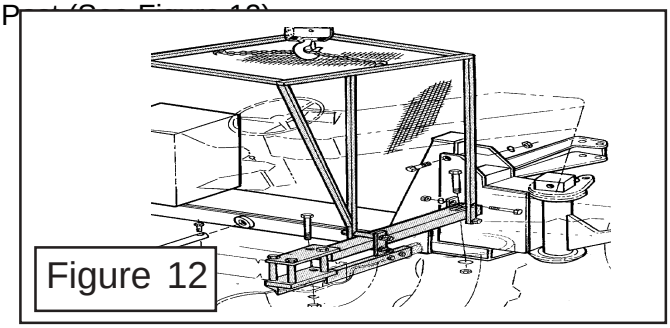

Figure 12

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7. Next, raise the Lift Cylinder under the Boom Weldment and attach to King Post Lug with bolt (P/N 00755076 for 17' A-Boom, P/N 00750479 for 20', 23', & 28' A-Boom), washer (P/N 00749946), and nut (P/N 02030300). Make sure hydraulic fittings are facing towards the rear of the tractor. Attach rod end of Lift Cylinder to Boom Weldment with bolt (P/N 00750479), washer (P/N 00749946), and nut, (P/N 02030300) provided in your Mount Kit (See Figure 14)**.** Tighten until Locknut firmly contacts ears on Cylinder. **DO NOT OVER-TIGHTEN.**

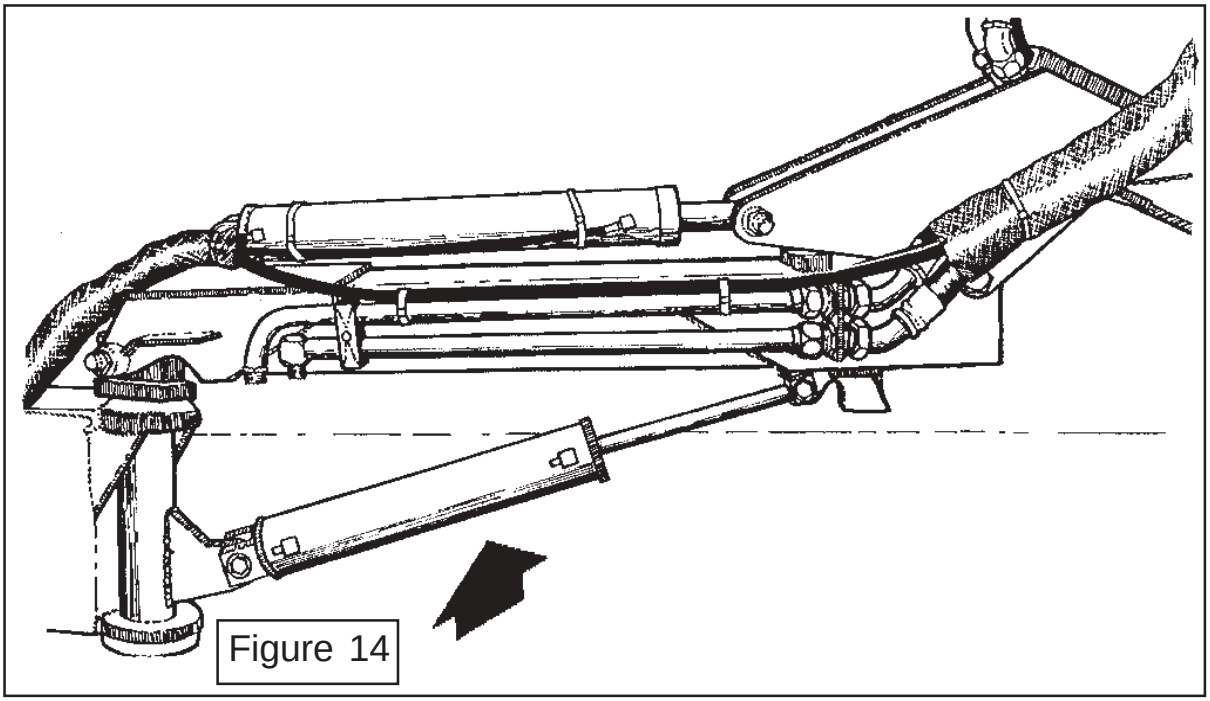

Figure 14

8. The Swing Cylinder comes pre-assembled on the Mainframe. If it is a standard rear-swing Boom, the Swing Cylinder will be installed as in Figure **15.** If it is a front swing Boom, the Swing Cylinder will be installed as in Figure 16. If the Cylinder is mounted incorrectly, reinstall in it's proper location.

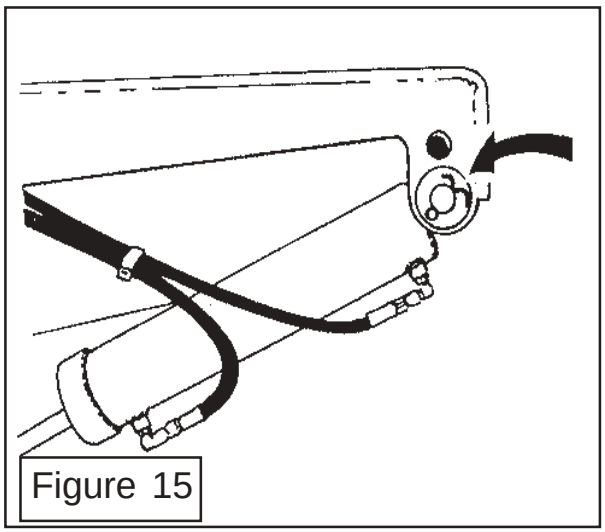

Figure 15

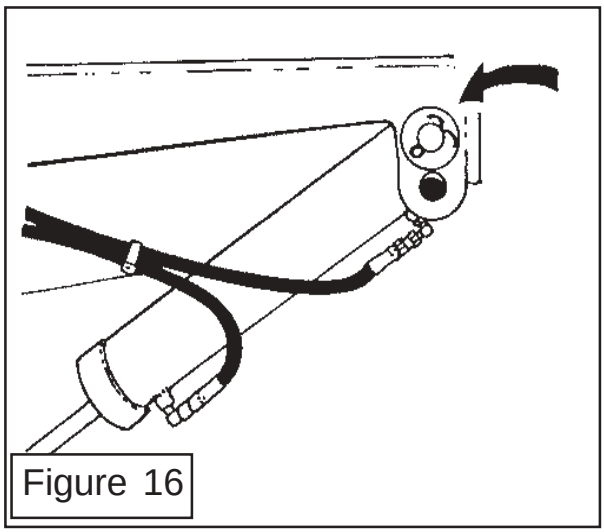

Figure 16

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9. X-Frame Square Head Attachment. With a forklift or hoist, lower the Boom Weldment down on the X-Frame Square Head. Align the Boom Weldment with the X-Frame

Square Head Hitch Post. Insert special bolts (item 1 p/n 02956972 and item 2 p/n 00752405) into Boom Weldment and Hitch Post. Attach nuts (item 3 p/n 02030300 and item 4 p/n 00037200) to bolt and tighten securely. Note: Additional support may be needed at the end of the Boom to aid in installation (See Figure 17).

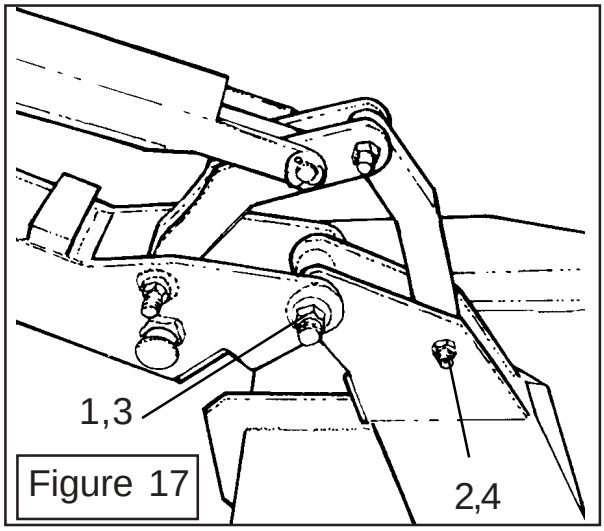

Figure 17

ATTACHMENT OF HYDRAULIC HOSES ON VERSA BOOM:

1. Attach the 1-1/4" Hoses from Solenoid Cutter Valve to Hydraulic Tubes on Boom.
2. Attach the 1/4" Hoses from the Control Valve to Lift Cylinder.
3. Attach the 1/2" Return Hoses from the Control Valve to the Pipe tee.
4. Attach the 1/2" Pressure Hose form the Hydraulic Pump to the Control Valve.
5. Attach the 1/4" Hoses from the Control Valve to the Swing Cylinder.
6. Attach the 1/4" Hoses from the Control Valve to the Dipper and Tilt Cylinder.

Refer to your Operator's Manual and Parts Listing for part numbers and pump driveshaft section of this manual for Hydraulic Schematic. Tighten any leaking Hydraulic Fittings. If fluid still leaks, loosen the fitting, apply a pipe thread compound to the threads and tighten. Care must be taken when tightening Hydraulic Fittings. Too much tightening can cause the fittings to crack and require replacement fittings. Use recommended hose end torque values. See torque chart in general information section. (See Figure 18).

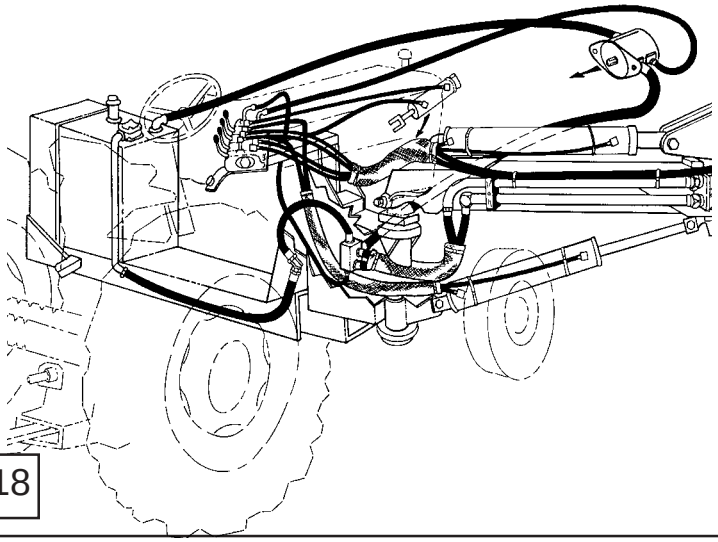
Figure 18

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ATTACHMENT OF HYDRAULIC HOSES ON VERSA BOOM: continued

7. Attach the 1-1/4" Pressure Hose (item 1) and Return Hose (item 2) from the Solenoid Cutter Valve (**See Figure 19**) to the Hydraulic Tubes on the Versa Boom (**See Figure 20**). Use the recommended hose end torque values in general information section.

8. Attach the 1/2" Return Hose (item 1) from Cutter Valve (See Figure 21) to the Control Valve (See Figure 22). Use the recommended hose end torque values listed in

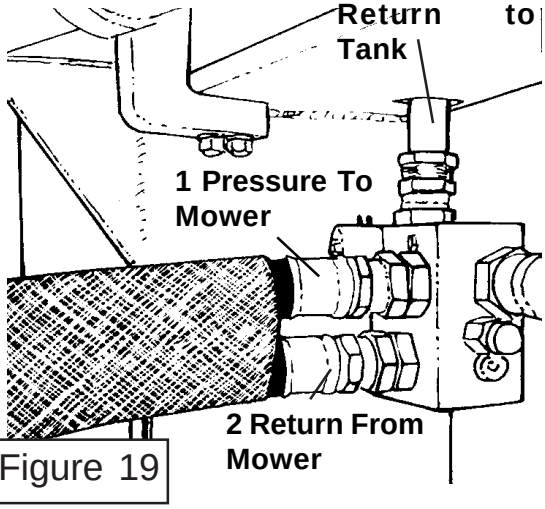

Figure 19

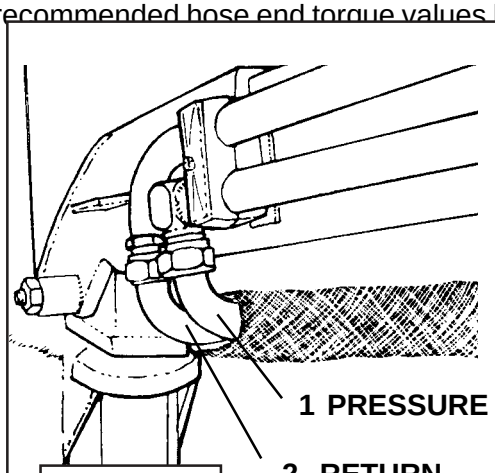

Figure 20

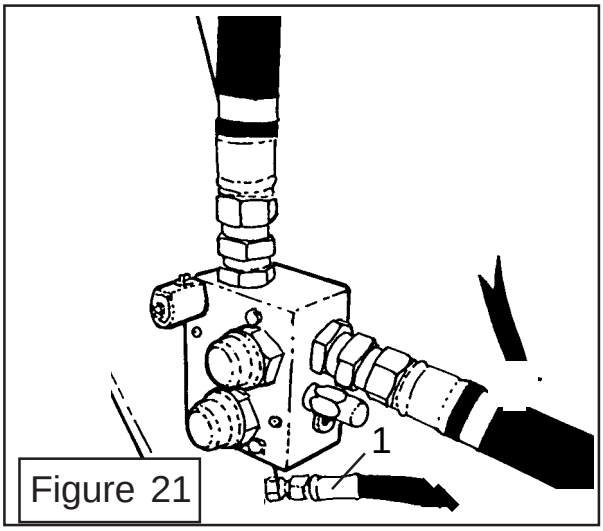

Figure 21

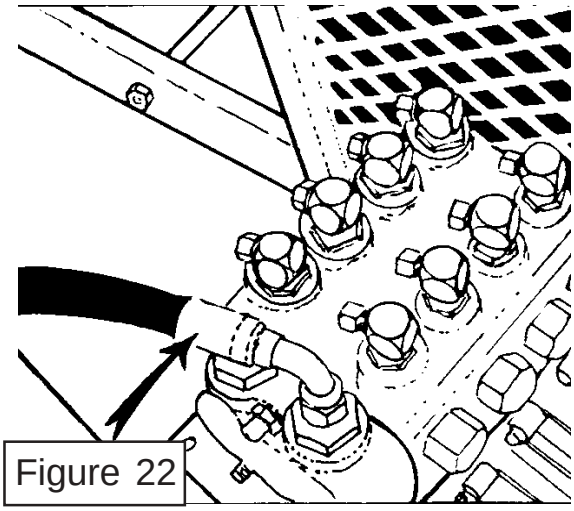
Figure 22

WARNING!

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks. If **ANY** fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

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ATTACHMENT OF HYDRAULIC HOSES ON VERSA BOOM: continued

9. Attach the 1/2" Pressure Hose from the Hydraulic Pump (**See Figure 23**) to the Control Valve (**See Figure 24**). Use the recommended hose end torque values on page 37.

10. Attach the 1/4" Hoses (item 1 and 2) from the Control Valve (**See Figure 25**) to the Swing Cylinder (**See Figure 26**). Use the recommended hose end torque values in general information section.

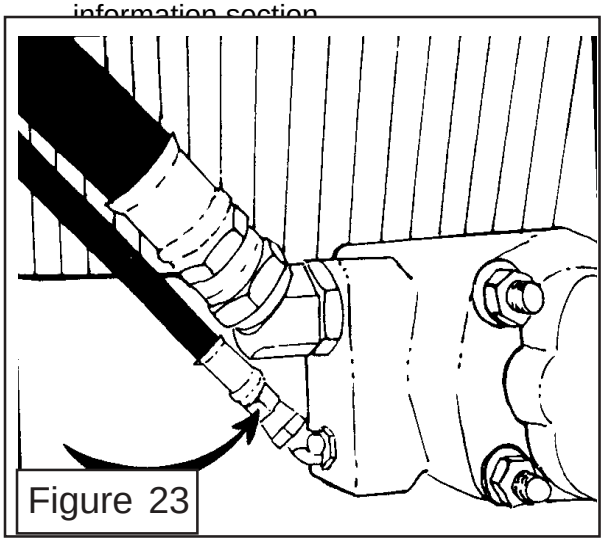
Figure 23

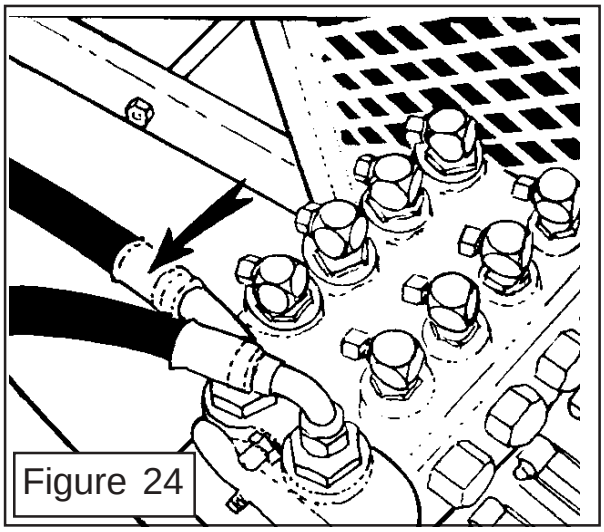
Figure 24

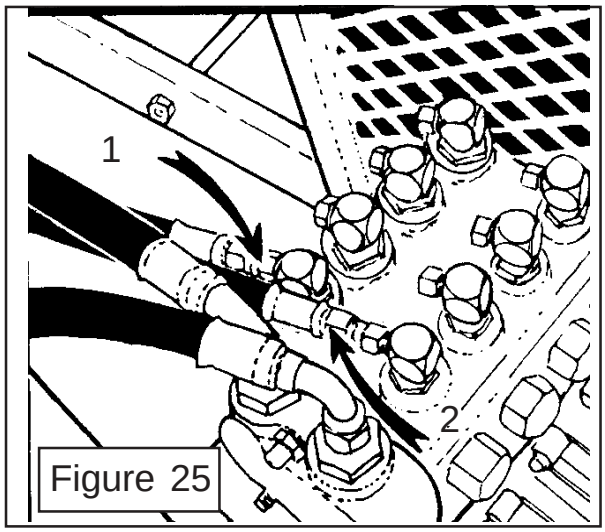

Figure 25

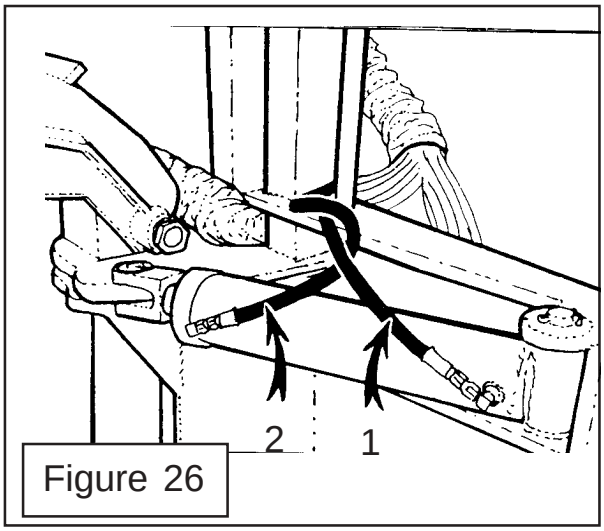

Figure 26

WARNING!

When working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards. Watch out for others.

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ATTACHMENT OF HYDRAULIC HOSES ON VERSA BOOM: continued

11. Attach the 1/4" hoses (item 1 and 2) from the Control Valve (See Figure 27) r outed around Solenoid Valve (See Figure 28) to the Lift Cylinder (See Figure 29). Use recommended hose end torque values. See General Information Section.

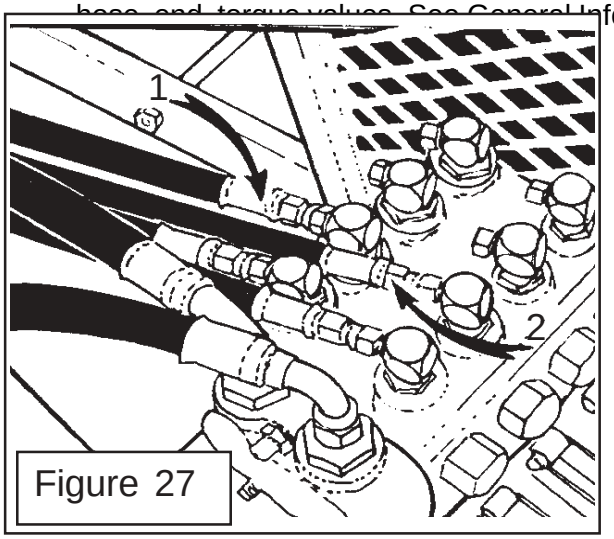

Figure 27

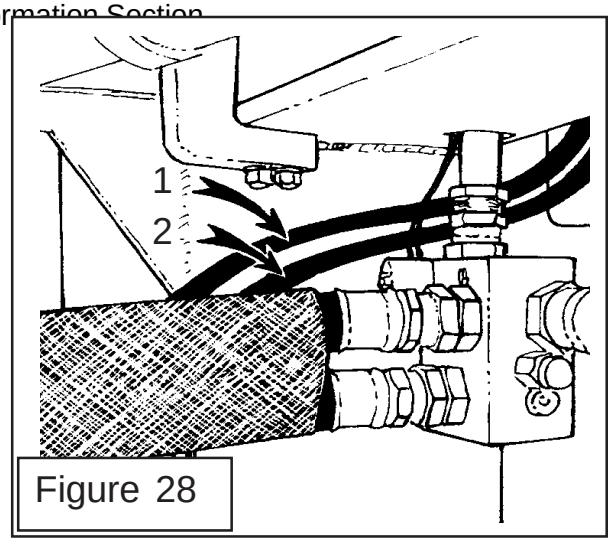

Figure 28

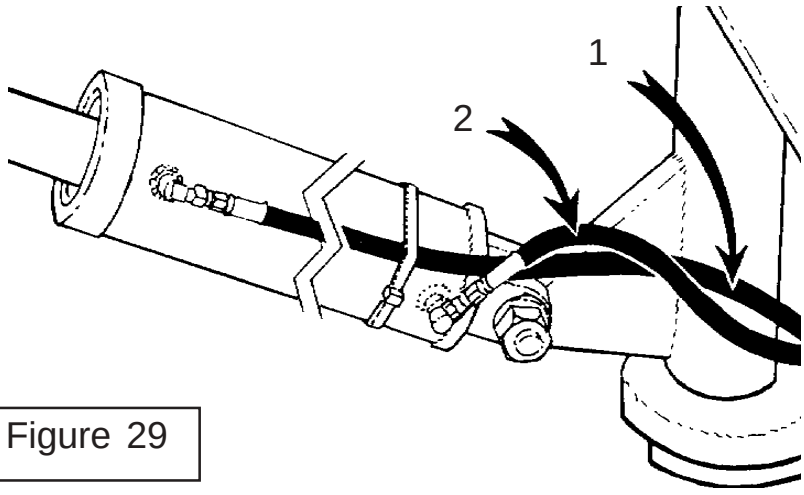

Figure 29

WARNING!

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks. If **ANY** fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

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ATTACHMENT OF HYDRAULIC HOSES ON VERSA BOOM: continued

6. Attach the Dipper Cylinder Hoses (item 1 and 2 **See Figure 30)** to the Control Valve (See Figure 31). Use the recommended hose end torque values, See Torque Charts in General Information section.

7. Attach the Tilt Cylinder Hoses (item 1 and 2 See Figure 32) to the Control Valve (See Figure 33). Use the recommended hose end torque values , See Torque Charts in General Information section..

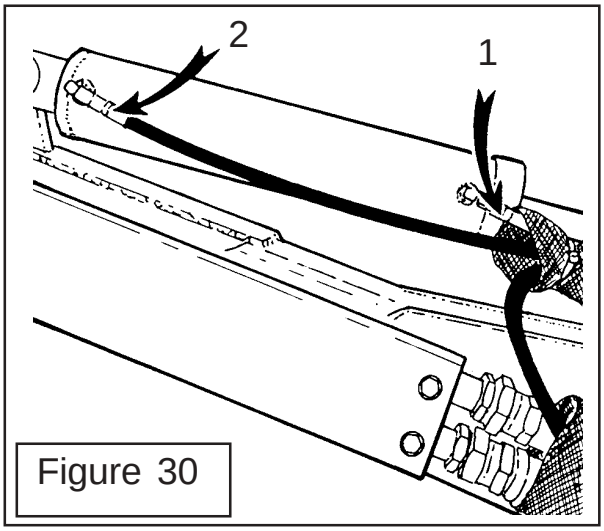

Figure 30

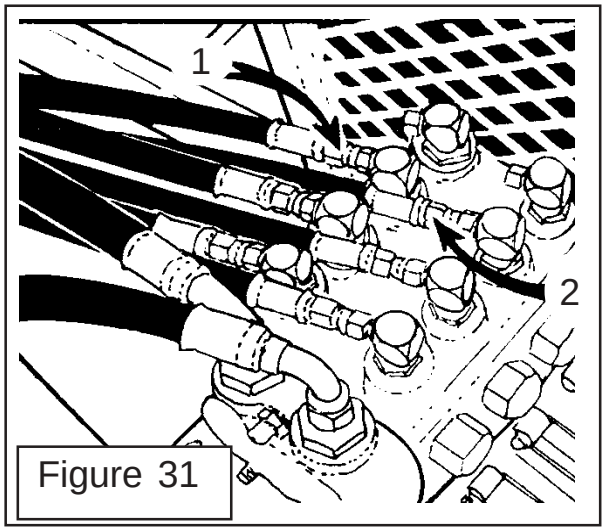

Figure 31

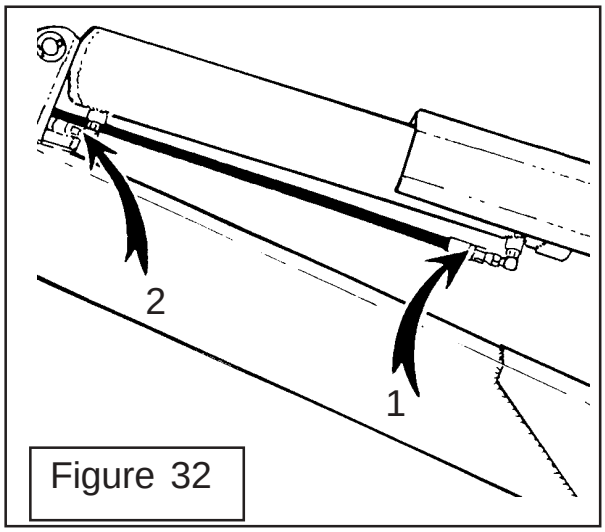

Figure 32

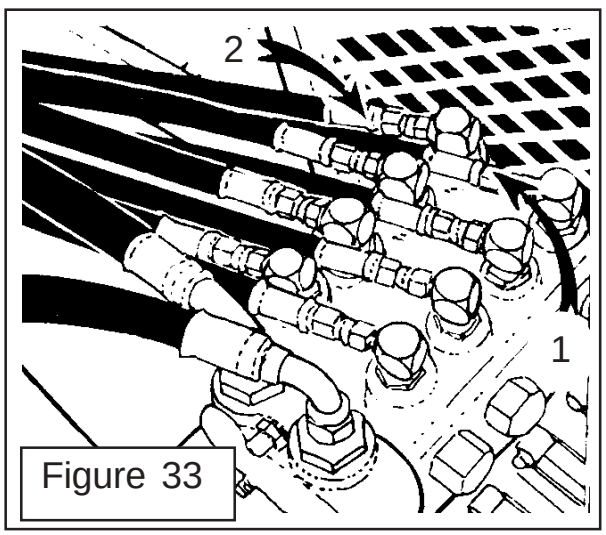

Figure 33

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ATTACHMENT OF HYDRAULIC HOSES ON VERSA BOOM: continued

8. Attach the 1-1/4" Hose, with the spiral steel band, from the Articulating Arm (See Figure 34) to the Hydraulic Motor on the Versa Boom Head (See Figure 35). Use the recommended hose end torque values, See Torque Charts in General Information section..

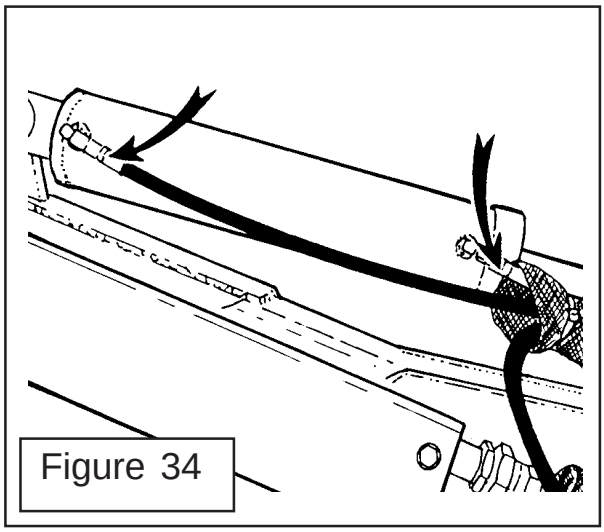

Figure 34

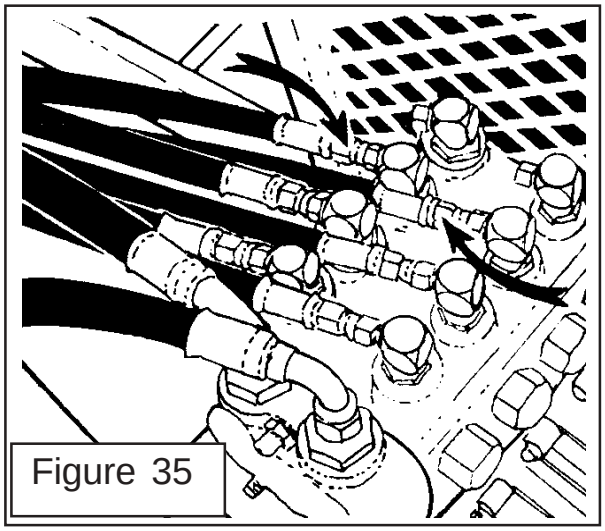

Figure 35

ATTACHMENT FLAIL AXE MOWER HEAD ON VERSA BOOM:

1. With a forklift or hoist, lower the Boom Weldment down on the Flail Axe Head. Align the Boom Weldment with the Flail Axe Hitch Post. Insert special bolts (Item 1 P/N 02956972 and Item 2 P/N 00752405) into Boom Weldment and Hitch Post. Attach nuts Iitem 3 P/N 02030300 and Item 4 P/N 000037200) to bolt and tighten securely. NOTE: Additional support may be needed at the end of the Boom to aid in installation (See Figure 36).

2. Attach Hydraulic Hoses as illustrated in FIGURE 85. Fully extend and retract tilt cylinder and make certain hoses do not bind or kink then secure fittings. Tighten any leaking Hydraulic Fittings. If fluid still leaks, loosen the fitting, apply a thread compound to the threads and tighten. Care must be taken when tightening Hydraulic Fittings Too much tightening can cause the fittings to crack and require replacement fittings. Use recommended hose end torque values found in chart on page 37.

NOTE:

Hoses should not interfere with mower operation such as being pinched kinked or entering the cutter housing. The hoses may be twisted slightly to hold them up and /or inward tighten the fitting once the proper location is found.

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Optional Heads Available

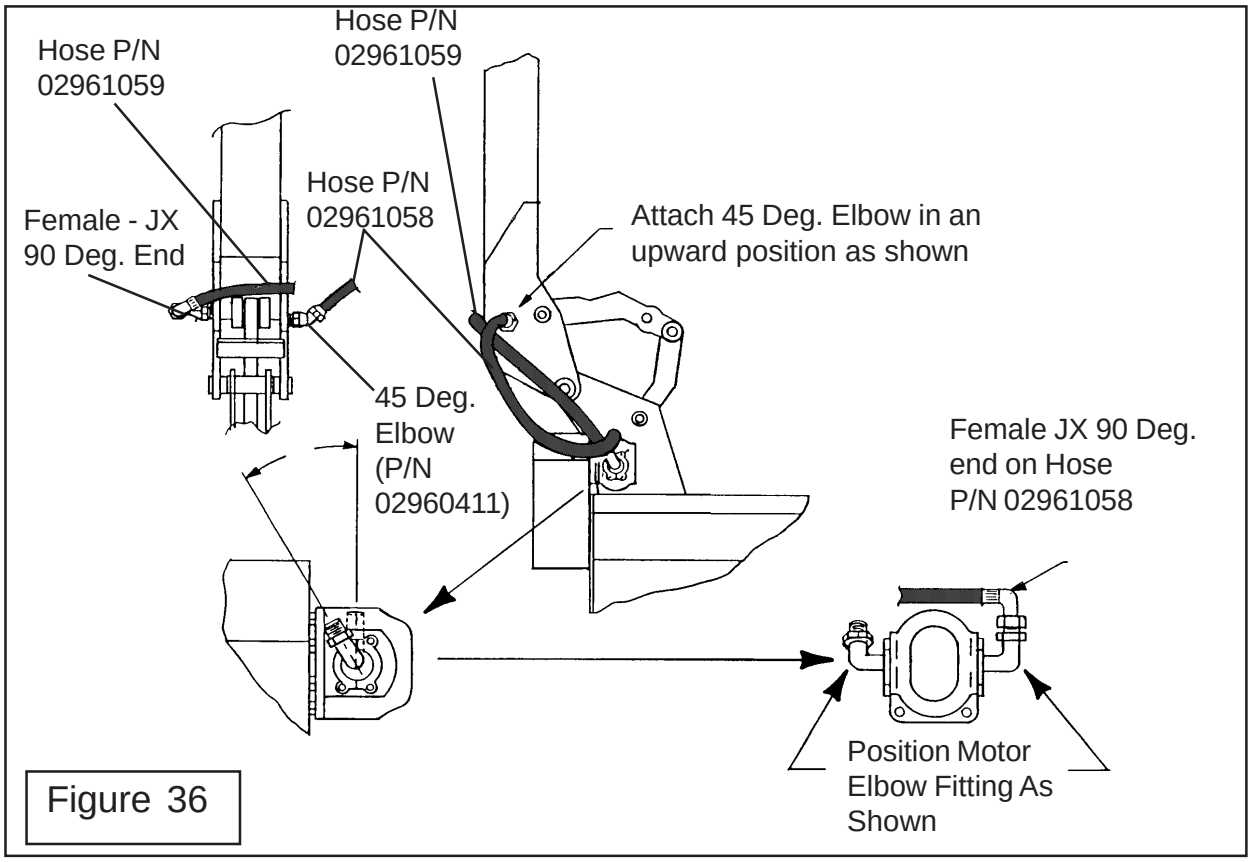

Figure 36

WARNING!

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks. If **ANY** fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

ATTACHMENT OPTIONAL FLAIL MOWER ON VERSA BOOM:

1. With a forklift or hoist, lower the Boom Weldment down on the Flail Mower Head. Align the Boom Weldment with the Mower Head Hitch Post. Insert special bolts (Item 1 P/N 02956972 and Item 2 P/N 00752405) into Boom Weldment and Hitch Post. Attach nut (Item 3 P/N 02030300 and Item 4 P/N 00037200) to bolt and tighten securely. ***NOTE****: Additional support may be needed at the end of the Boom to aid in installation (See Figure 37)*.

2. Attach Hydraulic Hoses as illustrated (See Figure 37) . Fully extend and retract cylinder to make certainhoses do not bind or kink. Then secure fittings. Tighten andy leaking Hydraulic Fittings. If fluid still leaks, loosen the fitting, apply a pipe thread compound to the threads and tighten. Care must be taken when tightening Hydraulic Fittings. Too much tightening can cause the fittings to crack and require replacement fittings. Use recommended hose end torque values charts found in general information section.

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Optional Heads Available

NOTE:

Hoses should not interfere with flail operation such as being pinched kinked or entering the cutter housing. Hoses may be twisted slightly too hold them up or inward. Tighten fitting once proper location is found.

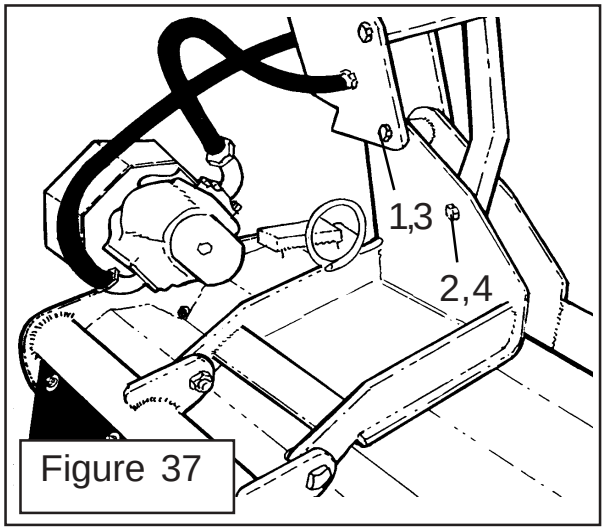

Figure 37

WARNING!

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks. If **ANY** fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

ATTACHMENT OPTIONAL FLAIL MOWER ON VERSA BOOM:

1. With a forklift or hoist, lower the Boom Weldment down in the Ditcher Head. Align the Boom Weldment with the Ditcher Head Hitch Post together. Insert special pins p/n 02958929 into Boom Weldment and Hitch Post. Attach with washer P/N 00749185 and roll pin P/N 00610600. ***NOTE****: Additional support may be needed at the end of the Boom to aid in installation* (See Figure 38).

2. Attach Hydraulic Hoses as illustrated (See Figure 38). Tighten any Hydraulic Fittings. If fluid still leaks, loosen the fitting, apply a pipe thread compound to the threads and tighten. Care must be taken when tightening Hydraulic Fittings. Too much tightening can cause the fittings to crack and require replacement. Use recommended hose end torque values found in the general information section.

Note:

The two hoses connecting the main boom to dipper arm are used to connect the Versa Ditcher motor. The 90 degree fit tings attach to the fittings on the main boom and the straight fittings attach to the 90 degree fittings on the hydraulic motor.

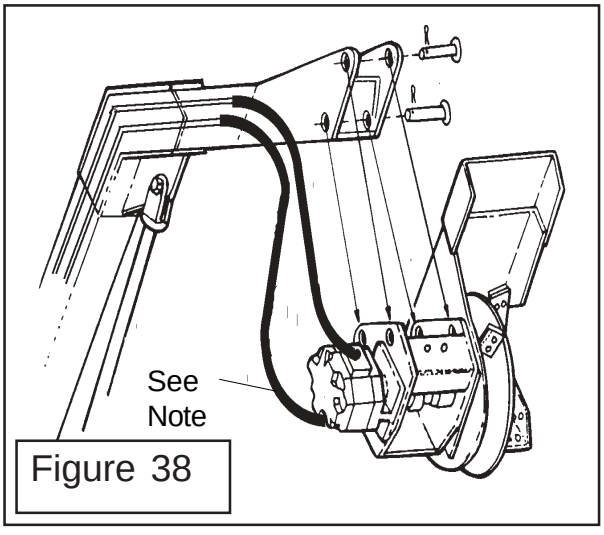

Figure 38

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Optional Heads Available

WARNING! Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks. If **ANY** fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

ATTACHMENT OPTIONAL TIMBER CAT HEAD ON VERSA BOOM:

1. Attach the Timber Cat Head to the boom using the pins included with the head. Be careful not to damage the pivot bushings in the boom when inserting the pins. Attach the 90° elbow (Item 1) to the front port of the boom and position it so that it faces down. Attach the 90° end of the return hose (P/N 02973125) to the fitting and attach the straight end to the 90° fitting (Item 2) on the flow divider (if it is not already connected). Attach the pressure hose (P/N 02973124) to the rear port of the boom and attach the other end to the 90° elbow (Item 3) on the flow divider (if it is not already attached). (See Figure 39). Be sure the hoses are routed as shown in the figure and securly tighten all connections. Start tractor and move the head tilt through its motions and check for excessive twisting and bending. It may require many attempts to obtain the optimum hose connection position.

2 Once Hose position is achieved, start the tractor and position the head in a safe area for operation, if necessary, baracade the head to prevent any contact while it is being operated. **This unit is dangerous - STAY AWAY - any time the tractor is in operation!** Turn on the head and bring the tractor engine up to normal operating speed (540 PTO RPM). Tighten any leaking hydraulic fittings. Caution, too much tightening can cause the fittings to crack and require replacement. Use recommended hose end torque valves found in the Maintenance Section.

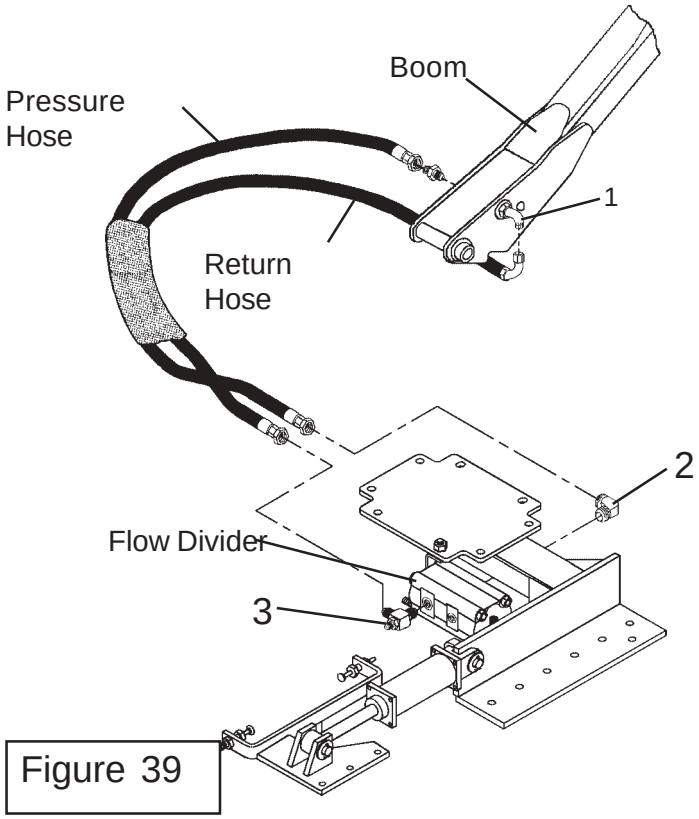

Figure 39

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BUZZBAR HEAD SHEAVE INSTALLATION:

1. Make sure the bushing and bore of the sheave are free of dirt, paint, metal chips, etc.

2. Insert cap screws and lockwashers engaging only 2 or 3 threads (See Figure 40).

3. With the key in the keyway, slide the loosely assemblied unit on to the shaft and position for good belt allignment. Shimming under the pulley may make it easier to position.

4. Carefully tighten cap screws alternately and progressively until tapers are seated. (About 5ft-lb)

5. Check sheave allignment and runout (wobble)

6. Continue careful alternate and progressive tightening of cap screws to 10 ft-lb. Maximum torque should achieved on each individual bolt only two times.

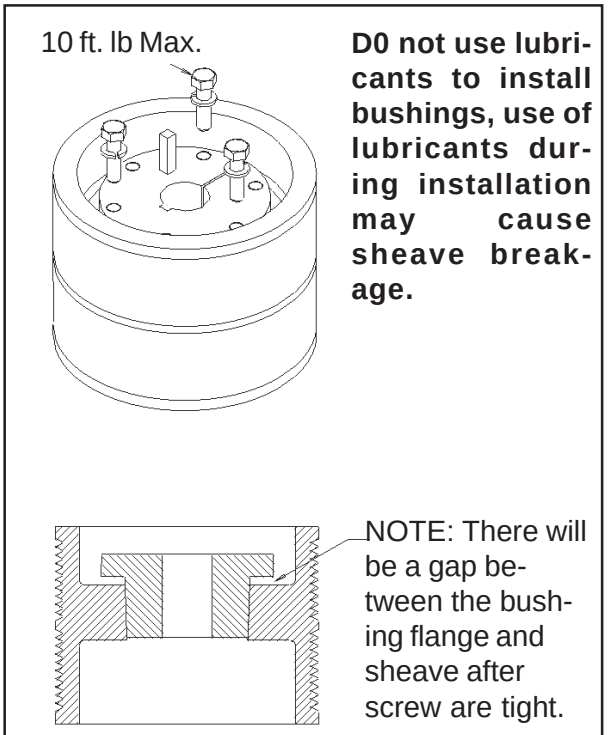
10 ft. lb Max.
D0 not use lubricants to install bushings, use of lubricants during installation may cause sheave breakage.
NOTE: There will be a gap between the bushing flange and sheave after screw are tight.

Figure 40

CAUTION

ALWAYS USE GLOVES WHEN HANDLING THE BLADES! BLADES INSTALLATION. Before removing or installing blades, make sure that the head is leaned back back past the vertical position. If the head is not, the blades can come off suddenly when the bolts are removed (See Figure 41)

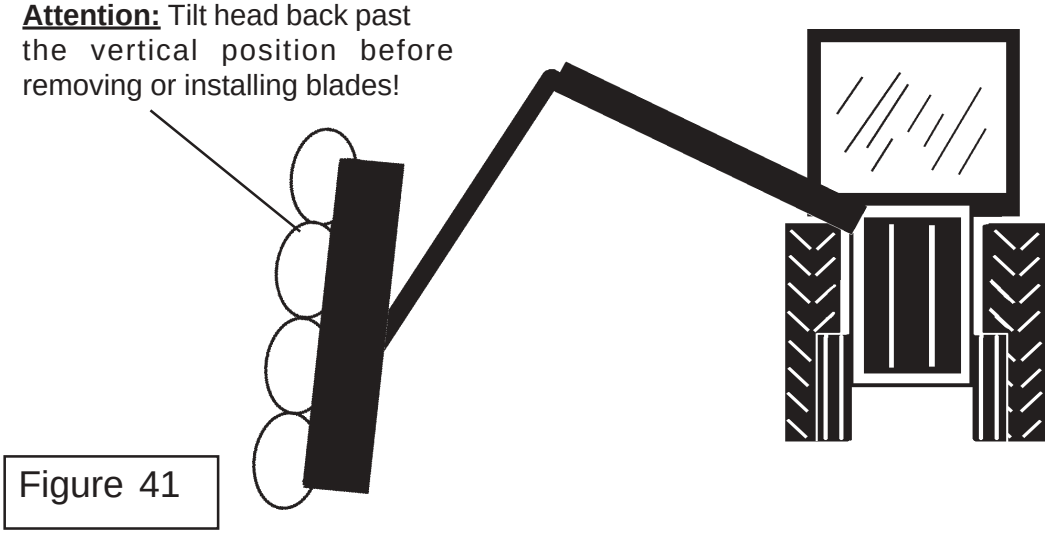

Figure 41

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NOTES

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Section 8

VERSA MOWER

Filling Hydraulic System
And
Initial Start up Instructions

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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Filling Hydraulic System

Check Attchment of Hydraulic Hoses:

WARNING! Once pumps are installed, DO NOT start the tractor (which will turn the pumps) unless the hydraulic circuits are completed and filled with the specified Universal Tractor Hydraulic oil and the pump has been primed. Running pumps without oil will cause non-warrant-able damage.

It is important that pipe thread sealant be used only on pipe threads; never on connections or on straight thread "O" ring fittings. Use the pipe thread sealant liquid only. Do not substitute with some other type of sealant, such as, teflon tape, paint, shellac, etc.

Hoses supplied have two types of fittings; solid or swivel. Some hoses have solid fittings on both ends; others have a solid fitting and a swivel fitting. Hoses with two solid fittings will fit into either a internal solid thread or a swivel adapter union. When installing either type hose, solid fittings must be installed first, then install the swivel end of the hose or fitting.
The Versa hydraulic system incorporates three basic types of hydraulic fittings:

A. Standard pipe (NPT or NPTF) thread fittings. This type requires a small amount of evenly-applied sealant.

B. Swivel fittings. This type does not require any sealant on the swivel end because it seals against an internal flare.

C. "O" Ring fittings. This type does not require any sealant on the "O" Ring end of the fitting.

It is extremely important to avoid getting pipe thread sealant inside the fittings or hoses. KEEP THE INTERIOR OF ALL HYDRAULIC COMPONENTS CLEAN. Inspect the inside diameter of each hose before assembly. Make certain that no obstruction is present. Dirt, sand, dust, etc., are abrasive and once in the system can cause immediate or early failure.

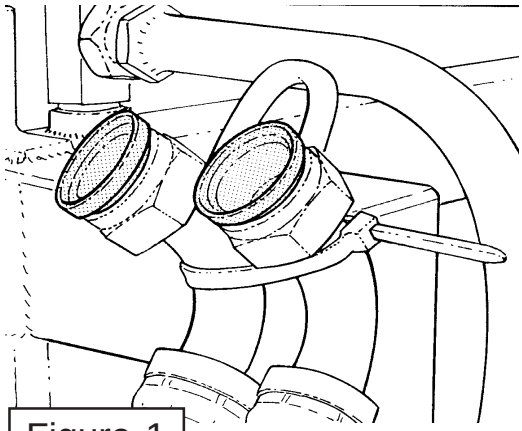

Figure 1

When assembling the fittings and hoses, be careful not to introduce any dust or contaminants into the system. Keep all fittings, hoses, and hydraulic components sealed until installed. Do not allow any components to lie open and exposed to dust or contamination. Do not lay parts down on the dirt or sand and then assemble them as this will introduce contaminants into the system.

CAUTION! To avoid Hydraulic Contamination, al ways keep all hoses and hydraulic fittings capped until they are ready to be installed (See Figure 1 & 2).

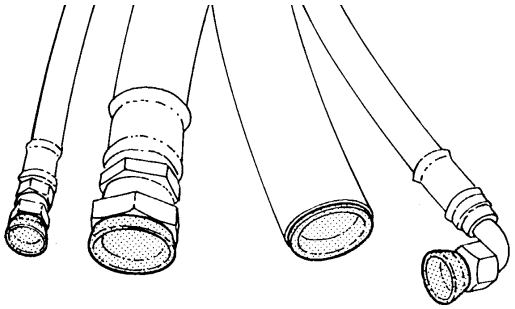

Figure 2

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Filling Hydraulic System

Fill Hydraulic System With Oil:

1. Remove the Filler Cap Weldment. It will be easier to unscrew the filler neck weldment to fill the hydraulic tank (See Figure 3).

2. Avoid Hydraulic Contamination is Important. Avoid hydraulic contamination by filtering the hydraulic oil while filling the hydraulic tank. Filter buggies or carts are commercially available for hydraulic system clean-up. These consist of a high-efficiency, high-capacity filter, a circulating pump, a drive motor, and hoses for connecting to the overhauled machine's hydraulic system (See Figure 4 & 5).

3. When adding hydraulic oil, use only new oil from a sealed barrel. Used oil or oil from an open barrel may contain high levels of contamination. Transfer the oil into the hydraulic tank by using a hydraulic filter pump unit equipped with a properly operating 10 micron filter. This will insure that the oil being added is clean. Do not just pour the oil directly into the hydraulic tank since most oils (even from a sealed barrel) have contaminants that must be removed, before operating the hydraulic system (See Figure 4, 5 & 6).

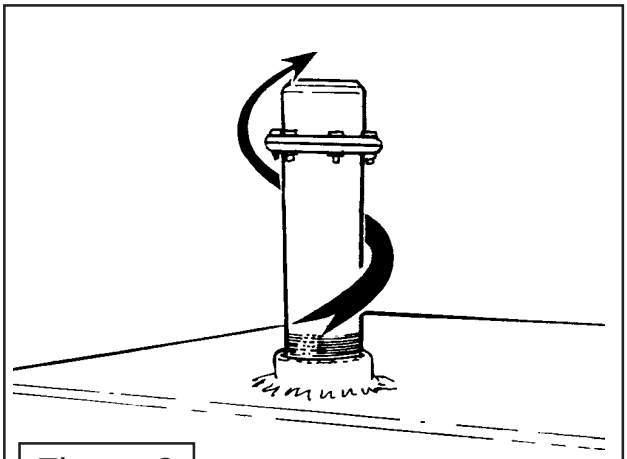

Figure 3

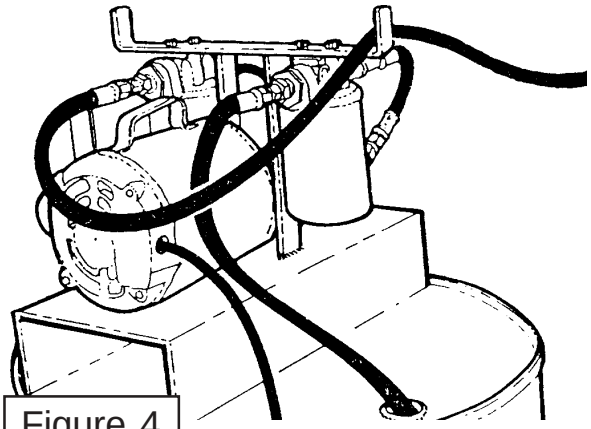

Figure 4

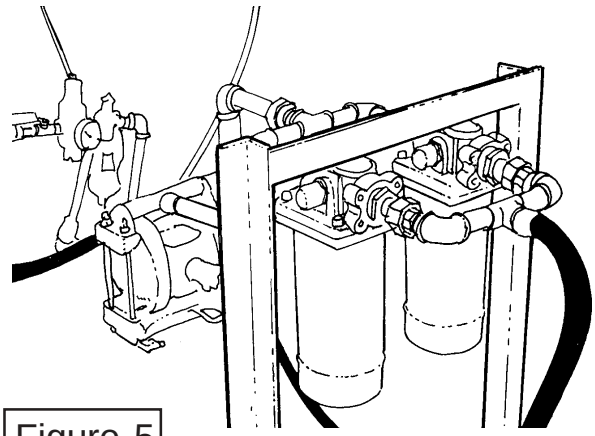

Figure 5

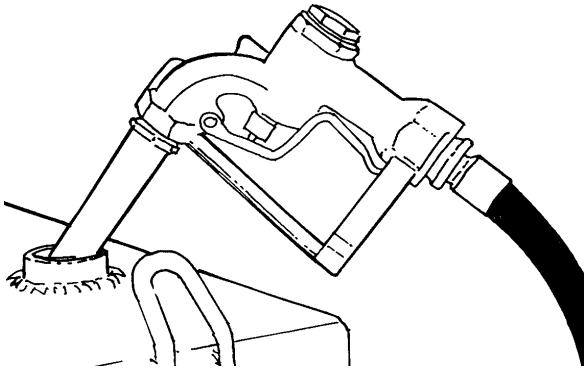

Figure 6

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Filling Hydraulic System

4. Fill Hydraulic Tank to Sight Guage. Fill the Hydraulic Reservoir until the fluid is visible through the sight guage (See Figure 7)

5. Fill Suction Hose with Oil. To Prevent the pump from a dry start up remove the suction hose at the tank, this clamp should have been left loose from earlier (See Figure 6). Fill the Suction Hose with hydraulic fluid so that the oil will run down into the pump, and reinstall on Hydraulic Tank. Tighten hose clamp securely (See Figure 8 & 9)

6. When Hydraulic Tank Is Full. When the hydraulic tank has been filled and the mower unit properly assembled, the unit should be started up. NOTE: Make sure that no materials, tools, or jacks have been left under the mower head. Make sure the front and rear of the mower are properly guarded to prevent any foreign objects from being thrown by the mower. All other workers should keep a safe distance from the unit before the mower is started.

7. IMPORTANT: Change the return filter in tank and suction filters after the first 200 hours of operation. Change the filters again at 700 hours; then, change the oil and filters at 1600 hours. After that, continue to change the filter every 800 hours and the oil every 1600 hours. Hydraulic oil to be used is Universal Tractor Hydraulic . Use the above procedures as part of a good filter maintenance program.

8. Monitor Oil Condition. Between filter changes, monitor condition of filter by reading Pressure Gauge mounted on filter on top of the Tank (See Figure 7). If pressure reads 15 psi or greater at 1800 RPM engine speed and normal operating temperature (140 deg. F. or greater), filter element should be changed. Pressure gauges are color-coded to help indicate when to change element.

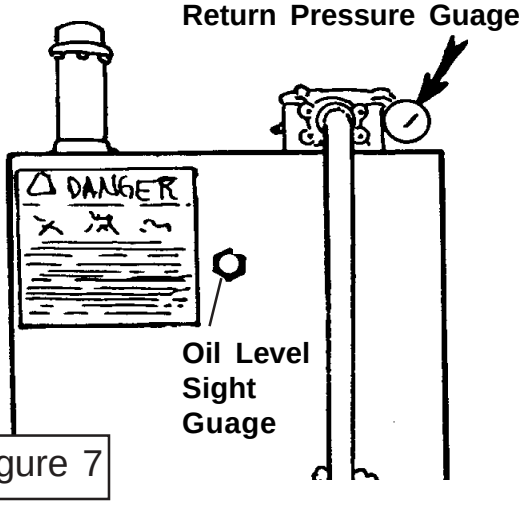

Figure 7

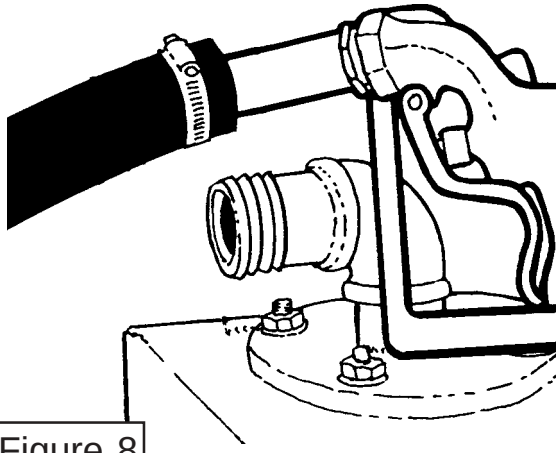
Figure 8

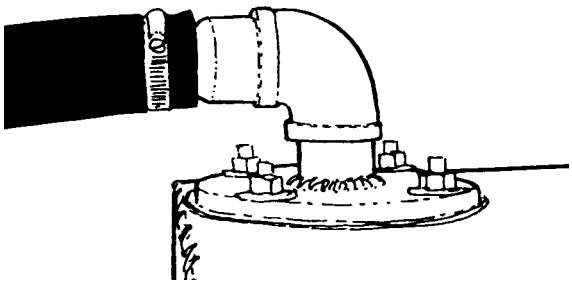
Figure 9

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Initial Start-Up Procedure

INITIAL START-UP PROCEDURE:

1. Check all nuts and hex head bolts to ensure all are tight and all lock washers are fully compressed (flattened).

2. Check all hoses and hydraulic connections. Make certain they are securely tightened. Refer to hose fitting tightening specification in the general information section.

3. Inspect all moving parts and make certain that no wires or hoses will be caught or pinched when the tractor or the mower is in operation. Tie down loose wires and hoses.

4. Thoroughly grease all the lubrication points and install a lubricap on each grease fitting. Refer to the Operation and Maintenance Section of the operators Manual for grease fitting locations.

5. Jack front of tractor up enough to allow axle to pivot through its full range. While turning wheels through their limits, right and left, swing them up and down. Look for interference between tires and any part of the mower or frame components. If interference occurs, shims (not furnished) must be welded to axle pivot stop or steering arm to limit the movement enough to avoid interference. Tractors with an adjustable front axle may require an outward or inward adjustment of the wheels.

6. To fill the hydraulic reservoir with new, clean hydraulic oil, follow the steps below. Refer to the Operation and Maintenance Section for specifications. (See Figure 10)

- **A.** Avoid hyd. contamination by filtering the hyd. oil while filling the hyd. tank.
- **B.** Filter buggies or carts are commercially available for hydraulic system cleanup. These consist of a high-efficiency, high-capacity filter, a circulating pump, a drive motor, and hoses for connecting the overhauled machine's hydraulic system.

7. After the frame and mower is completely assembled to the tractor and with the mower head on the ground, fill the mower hydraulic tank above the oil level sight gauge approximately 5" or 1" below the top of the tank.

8. With mower ON/OFF switches in "ON" position & tractor fuel cut off, crank engine for 30 to 45 seconds to push oil to the pump and motor. Check the oil level in the sight gauge. If no oil is seen add oil to bring the level up to the sight gauge. NOTE: Do not fill the tank with oil above level of sight gauge. Over filling tank with oil after the initial filling may result in oil being discharged through the air filter on top of the hyd. tank. Start the tractor and run it for 2 minutes and turn it off. Again check the oil level in the sight gauge. If the oil level is in the sight gauge, the unit is ready to run. If no oil seen, add oil to bring the level up to the sight gauge.

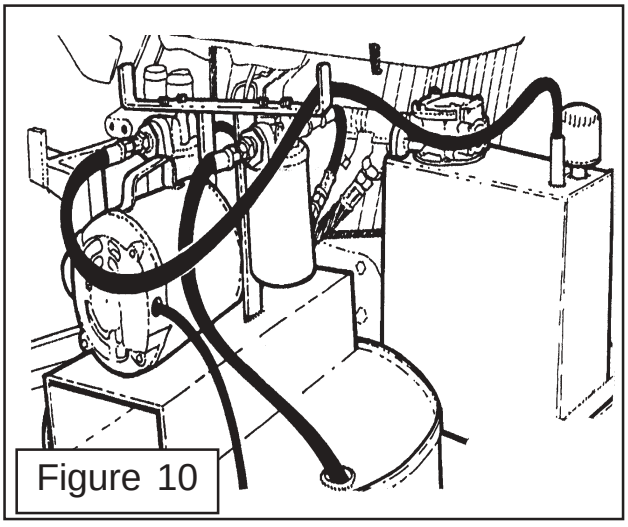

Figure 10

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Initial Start-Up Procedure

9. After hydraulic system is fully charged and functioning properly, switch cutter units on, then speed engine up to 540 RPM PTO speed. Maintain this speed for about 5 minutes. Check complete mower assembled components, look for any leaks, loose connections, or anything that could cause premature wear or failure.

10. FINAL CHECK: Run Mower for about 1/2 hour at full speed. Check for leaks and vibrations. Frequently check oil temperature. Make certain it does not exceed 180 deg.
NOTE: When raising wings, make certain there is no interference with mower, frame, cylinders or tractor. Lift wings slowly.

CAUTION: DO NOT leave unit unattended, and COMPLY WITH ALL WARNING DECALS.

If unit starts to make unusual noise, stop unit and check oil level. Also check for frothy oil which would indicate a leak on suction side of system.

CAUTION: ROTATING KNIVES!

Remove all foreign objects and stand clear of cutter units. DO NOT GET NEAR!
NOTE: On tractor hydraulic powered circuit only, make certain that there is full flow from tractor hydraulic system to control valve. Refer to tractor manual.

11. Read and fill out customer pre-delivery check list on following page. Go over these details with the customer and operators before delivery the unit is recommended. Shoe the operator where all lubrication points are. Where the Oil level is checked. the safety decals located on the unit and the operational decals. Operator should be completely familiar with the unit before operating it.

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Customer Pre-Delivery Check List.

1. ____ Is oil level in the tank even with the sight gauge on the tank?
2. ____ Has the proper oil been used in the system? Proper oil is Universal Tractor Hyd. Oil.
3. ____ Boom machine movement matches operation decal - Swing, Lift, Dipper, & Tilt?
4. ____ Is control valve and auxiliary control cables free and not stick?
5. ____ Are all hoses tight and do not leak? See hose fitting torque chart in general information section.
6. ____ Are all decals in place? See operators manual for decal description and placement.
7. ____ Does tractor pass Alamo Industrials Mower Stability Test? Proper weights added?
8. ____ Have all grease points been adequately greased?
9. ____ Are all bolts tight? See bolt torque chart in the general information section.
10. ____ Have all hoses been properly routed so that hoses do not kink or bind when boom is articulated through all motions?
11. ____ Does starter lockout device work correctly on machine? Tractor should not start if mower switch is on.
12. ____ Is swing cylinder pinned in correct hole? On rear swing type machine, cylinder should be pinned to outside hole. On front swing type machine, cylinder should be pinned in inside hole.
13. ____ Is machine equipped w/ proper operator protection? Must have cage or cage panels.
14. ____ Does mower operate when on/off switch is operated?
15. ____ Is head rotation correct? On rotary heads (looking from the top of the deck) rotation should be clockwise so that debris will be thrown away from the tractor. On flails, rotation can be forward or reverse, but forward rotation is standard.
16. ____ If operating a square head, are spindle housing bolts tight? Is spindle assembly tight? Are bolts that hold blade bar to spindle tight?
17. ____ Does head operate smoothly at normal operating speed? Head should not vibrate excessively .

All the above items should be checked off before delivery of mower unit to customer & operator.

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NOTES

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Section 9

VERSA FLAIL

Mounting Specifications

Case -IH Tractor
MXU 100 / 110 Cab/4wd

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Mount Restrictions

Case-IH MXU-100/110 Cab/4wd *As Of : 9-04*

Max front tire: 13.6-24 (Radial)
Max rear tire: 16.9-34 (Radial)

Versa Mount Kit 02981497

Options:

Lexan Window Kit 02980888
Side Screen Kit 02980642
Pump Guard Kit 02980652
Hydro 60/72 Mount Kit 02980830
Extra Versa Installation Manual 02981763

Restrictions:

(1) In order to clear the front 4wd tires, the Versa frame must be positioned beside the platform resulting in the removal of the right hand steps. Ingress/egress on the right is otherwise blocked by the control stand. This frame position unfortunately causes overwidth transport *(~126" with Versa flail & max tire sizes listed above)*.

(2) The rear tires must be set at a full spread to allow enough clearance for the oil reservoir which is located below the left rear fender *(See Figure 1)*.

(3) Effective January 12, 2004, Case-New Holland began providing loader brackets as standard equipment with this tractor series. These brackets must be removed for proper Versa frame mounting. Plan at least an extra hour or two to complete the removal.

(4) This kit includes a battery relocation bracket which shifts the battery up and back at an angle. *(See Figure 2)* Furthermore, as a result of the Versa frame position, the battery box will no longer hinge outward. However, the battery can still be accessed and even removed with the assistance of one additional person.

(5) Also included is exhaust modification kit #02980717 which allows the vertical A-post style exhaust to be moved in approximately 8 1/2". This in turn allows the Versa frame to be installed closer to the centerline of the tractor.

(6) A Neapco style driveline with double U-joints is utilized for this kit. An additional hole must be drilled through the cast “rib” of the front bolster just below the radiator in order to install the driveline half which fastens to the crankshaft pulley. This process takes forty five minutes to an hour and should not affect the structural integrity of the bolster.

(7) The Neapco driveline kit includes a pump box which shifts the hydraulic pump approximately 6 1/4" forward. Though it is structurally sound, Engineering recommends the use of a pump guard to protect your investment.

(8) Optional wheel weight kits are designed to fit flanged rims only. Other rim styles may require a wheel weight adapter to be provided at the dealer/customer’s expense.

(9) Lexan window insert #02966458 can not be installed with the side screen kit due to the extreme curvature of the glass door.

(10) The Versa frame and stabilizer have been designed to provide a minimum of 13" of ground clearance on tractors equipped with 16.9-34 rear tires.

(11)The Lexan window kit option is comprised of a molded piece of General Electric brand 3/8" Lexan with a scratch resistant coating on both sides. It has been designed as a replacement for the standard right hand, tempered glass door that comes equipped with the tractors.

First Cut w/Long Extension Arm *(Short Ext. Arm is Not Optional)*

Rotary: ~68 3/4" **(Notice: HY60/72 will not have enough overlap!)**
Flail: ~70 1/2" (SHD96 OR 30.5" => 8" Overlap)

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Mount Restrictions

Figure 1: Under-Fender Oil Reservoir

Figure 2: Battery Relocation

Figure 3: Motor Hose must be turned as shown

Figure 4: Cutter Valve Relocation Bracket must be used

Figure 5: Tractor Exhaust Must Be Modified

Figure 6: Tractor is 4 Wheel Drive

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Mount Kit Components

IMPORTANT NOTICE: The following Part / Assembly Numbers are for reference and should not be ordered as replacement parts, unless all the components in that assembly are wanted. These will break down to bills of material of the components. Some of numbers listed are NOT individual Parts but complete assemblies and/or box of assemblies. Check before ordering.

02981497 Versa Mount Kit : Consist of the Following 3 Asy No.

Asy. No.	Qty	Description	Qty
02980869	1	ASY VERSA TANK UNDER FENDER (See Below BOM)	
02981498	1	COMP. BOX, CASE-IH MX100/110U V/M (See Below BOM)	
02981723	1	STABILIZER, CASE-IH MX100/110U	

These Three items are included in Versa Mount Kit P/N 02981497

02981498 Component Box: Consist of the following Item No.

Item No.	Qty	Description
000859	10	TIE, PLASTIC
02026200	2	HOSE CLAMP, 1-5/16” TO 2-1/ 4
02879100	1	MOUNT-STABILIZER BAR
02960409	2	ADAPTER, TUBE, ELBOW
02961098	1	ADP HYD ELBOW 20MB -20MJ 90
02961826	1	FRONT PUMP ASY-TANDEM,1-1/4 CAST
02966873	1	DWG INST BOOT
02966874	1	BOOT,CABLE
02971199	2	CABLE, REMOTE CONTROL - 102
02973712A	1	ASY DRIVELINE 7/8-13 SPLINE
02978816	2	PLATE VERSA WELD-ON
02959770	7	HOSE SUPPORT RING
02980719	1	ASY., TS-A PUMP MOUNT W/COVER
02980726	1	KIT, NH TS-A CONTROL STAND
02980699	1	PULLEY ADAPTER NH TS-A
02978281	2	WLDMT, HOSE RING
02981499	1	BOLT BAG, CASE-IH MX100/110U VM
02972560	1	HOSE SUCTION #24 -180LG
02980717	1	KIT EXHAUST RELOCATION
02981337	1	HOSE #20-20FJX -20FJX 150LG
02981218	1	FRONT MOUNT PLATE LH.
02981219	1	FRONT MOUNT PLATE RH.
02981331	1	BRACKET, TANK TO AXLE
02981750	1	KIT, BATTERY RELOCATION
02981518	2	REAR MOUNT PLATE
02980990	1	BRACKET, CUTTER VALVE RELOCATE
02960407	2	ADP HYD ELBOW 20MJ -20FJX 90
02981761	1	HOSE #20-20FJX -20FJX 73LG
02960004	1	HOSE #8 - 8FJX - 8FJX90 92LG
02961825	1	HYD ADP ELBOW 20MB -20MJ 45
02981763	1	MANUAL, INST-CASE-IH MX-U VERSA

Component Box is included in Versa Mount Kit P/N 02981497

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Mount Kit Components

02980869 Tank Asy, Under Fender: Includes Following Item No.

Item No.	Qty	Description
00001800	4	LOCKNUT 1/2" NC
00002700	4	FLATWASHER 1/2" PL STD
00015800	4	LOCKNUT TLM 3/8"
00017000	4	LOCKWASHER 1/4" PL STD
00024100	4	FLATWASHER STD 1/4"
000644	4	CARRIAGE BOLT 3/8" NC X 1-1/4" PL GR5
00756059	1	DECAL-WARNING OIL LEAK
02049700	1	SIGHT, GAUGE 16MP
02886900	4	CARRIAGE BOLT, 1/2"-13UNC X 1-1/2" PL GR5
02897300CA	1	ASSEMBLY. VERSA CANNISTER MANUAL
02957069	1	VERSA SUCTION ASSEMBLY
02960809	1	ADAPTER, HYD, STGHT
02961000	1	FILTER ASSY-RETURN,IN TANK
02961255	4	PUSHNUT, BOLT RETAINER, 3/8"
02962864	4	WASHER,SEALING 3/8"
02962963	1	DIAL INDICATOR-IN TANK FILTER
02963620	1	CAPLUG PLASTIC FEMALE #16MP
02963621	1	CAPLUG 1-5/8" TO FIT 20MP FITTING
02963659	1	PLUG,1 MAGNETIC
02963661	1	GASKET,SUCTION PLATE, FIBER
02963662	1	GASKET,FILTER ASY,FIBER
02965262	1	DECAL- WARNING HOSE BURST
02966305	1	DECAL,UNIVERSAL TRACTOR
02976124	4	INSERT KNURLED & THREADED
02977385	1	AG MANUAL HOLDER CANISTER
02977417	1	DECAL OPERATORS MANUAL INSIDE
10058000	4	BOLT, HEX HEAD 1/4" NC X 1" PL GR5
1458392	1	DECAL,RED REFLECTOR
63161900	4	SPRING NUT 1/2"
02980215	1	BREATHER CAP ONLY W/ RING
02047200	1	ADAPTER, HYD, ELBOW
02981311	1	WLDMT, VERSA TANK UNDER FENDER

Tank Asy is included in Versa Mount Kit P/N 02981497

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Mount Kit Components

02981499 Bolt Bag: Includes Following Item No.

Item No.	Qty	Description
02975692	20	BOLT, HEC HEAD M20-P2.5 -50MM PL10.9
02971158	20	LOCKWASHER, 20MM
02977576	8	BOLT, HEX HEAD M18-P1.5 X 60MM PL10.9
02970066	8	LOCKWASHER, 18MM
02959390	14	BOLT, HEX HEAD 3/4" NC 2-1/4" PL GR8
00000200	14	NUT 3/4" NC HEX PL
00003901	14	LOCKWASHER 3/4" PL
5312316	2	WASHER, HARDENED 25/32" ID
02892000	6	BOLT, HEX HEAD, 1/2"-13 NC x 1-1/2" PL GR8
00001300	2	LOCKWASHER 1/2"
02976344	4	BOLT, HEX HEAD 7/16 NC 1-1/4" PL GR8
00022200	4	LOCKWASHER 7/16" PL
02980720	4	BOLT, HEX HEAD M12-P1.75 X 40 PL 10.9
00754566	4	LOCKWASHER, 12MM
00001800	4	NUT 1/2" NC LOCKNUT
00015800	2	LOCKNUT TLM 3/8"
00011100	2	FLATWASHER STD 3/8"
00753642	2	BOLT, HEX HEAD 3/8" NC X 1-1/4" PL GR5

Bolt Bag is included in Component Box P/N 02981498

02961826 Pump Asy: Includes Following Item NO.

Item No.	Qty	Description
00749101	1	SPLIT FLANGE KIT 1-1/2
02961735	1	PUMP-FRONT-TANDEM,37GPM,8GP
02961825	1	HYD ADP ELBOW 20MB -20MJ
02962214	1	ADAPTER, HYD, ELBOW
02979375	1	45 DEGREE FLANGE FITTING

Pump Assembly is included in Component Box P/N 02981498

02980719 Pump Mount & Cover : Includes Following Item No.

Item No.	Qty	Description
02980666	1	WLDMT PUMP MOUNT TS-A
02980398	1	COVER, DRIVE LINE
00021400	4	BOLT, HEX HEAD 1/4" NCX 3/4" PL GR5
00024100	4	FLATWASHER STD 1/4" PL
00017000	4	LOCKWASHER 1/4" PL STD

Pump Mount & Cover Assembly is included in Component Box P/N 02981498

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Mount Kit Components

02980717 Exhaust Relocation Kit: Includes Following Item No.

Item No.	Qty	Description
02980649	1	WLDMT EXHAUST BRACKET
02980718	1	WLDMT, TURBO DOWNPIPE
02980584	2	KIT 3" EXHAUST CLAMP
02980727	4	BOLT, SOCKET HEAD, M8-P1.25 x 35mm PL10.9
02980728	3	BOLT, HEX HEAD, M12-P1.75 x 30mm PL10.9
701513C	3	FLATWASHER M12
00754566	3	LOCKWASHER, 12MM

Exhaust Relocation Kit is included in Component Box P/N 02981498

02980726 Control Stand Kit : Includes Following Item NO.

Item No.	Qty	Description
00755954	2	LOCKWASHER M10 SPRING
00762398	2	BOLT, HEX HEAD, METRIC 10-P1.5 - 30MM PL5
02980914	1	PLATE, CONTROL STAND NH TS-A

Control Stand Kit is included in Component Box P/N 02981498

02981750 Battery Relocation Kit : Includes Following Item NO.

Item No.	Qty	Description
02981725	1	WLDMT BATTERY BRACKET
00011400	3	BOLT, HEX HEAD 3/8” X 1” NC
00012101	3	LOCKWASHER 3/8” PL
00013901	3	NUT HEX, 3/8” NC PL

Battery Relocation Kit is included in Component Box P/N 02981498

DO NOT ORDER ASSEMBLIES UNLESS COMPLETE ASSEMBLY WANTED, IF YOU WANT ASSEMBLY THEN ORDER TOP ASSEMBLY NUMBER ONLY, COMPONENTS IN ASSEMBLIES MAY HAVE MORE COMPONENTS THAN YOU WANT. CHECK BEFORE ORDERING.

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NOTES

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Versa Flail Assembly Manual
Case-IH MXU 100/110
2004 Edition
Manual P/N 02981763

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